

## Appointment

---

**From:** Carbonell, Tomas [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=15ec2a6ad2934c669f6a675e7cf4961b-Carbonell,]  
**Sent:** 7/8/2021 10:22:02 PM  
**To:** Alisa Petersen [apetersen@rmi.org]

**Subject:** Accepted: EPA/RMI ENERGY STAR Discussion

**Location:** [https://](#) **Ex. 6 Personal Privacy (PP)**

**Start:** 7/9/2021 5:00:00 PM

**End:** 7/9/2021 6:00:00 PM

**Show Time As:** Busy

## Appointment

---

**From:** Levy, Maxwell [Levy.Maxwell@epa.gov]  
**Sent:** 6/15/2021 6:14:31 PM  
**To:** Levy, Maxwell [Levy.Maxwell@epa.gov]; Enobakhare, Rosemary [Enobakhare.Rosemary@epa.gov]  
**CC:** ejcoalition.michigan@gmail.com; vmiller-travis@metgroup.com; Angelo Logan [alogan@oxy.edu]; Beverly Wright [beverlyw@dscej.org]; beverlywright@gmail.com; Hiltonkelley5011@gmail.com; pamela@akaction.org; Viola Waghiyi [Vi@akaction.org]; miya@apen4ej.org; LaTricea Adams [President@blackmillennials4flint.org]; glinson@caleja.org; CEJCoalition@gmail.com; newbian8 [newbian8@verizon.net]; nsheats@tesu.edu; blauderdale@earthlink.net; dmolina@cbecal.org; moniqueh@dscej.org; mroberts [mroberts@comingcleaninc.org]; DianeT@environmentalhealth.org; djwil51@gmail.com; ientomg@gmail.com; jose@just-transition.org; kwasserman@lvejo.org; jnwomack1@yahoo.com; tljslc@gmail.com; AliM@nwf.org; newalphacdc@gmail.com; Leownaconsulting@gmail.com; huy@opalpdx.org; poder.austin [poder.austin@gmail.com]; mychaljohnson@gmail.com; jinemexico@gmail.com; Ana.parras@yahoo.com; parras.juan@gmail.com; Harambee@gmail.com; swilson2 [swilson2@umd.edu]; elizabeth@uprose.org; kerene@weact.org; peggy@weact.org; Na'Taki Jelks [nojelks@wawa-online.org]; wera1usa@gmail.com; interfaith.earth@yahoo.com; drrobertbullard [drrobertbullard@gmail.com]; scharoldmitchell [scharoldmitchell@gmail.com]; kteglad@aol.com; kteglad51@gmail.com; Fine, Philip [Fine.Philip@epa.gov]; McMichael, Nate [McMichael.Nate@epa.gov]; Wieder, Jessica [Wieder.Jessica@epa.gov]; Cherepy, Andrea [Cherepy.Andrea@epa.gov]; Wood, Anna [Wood.Anna@epa.gov]; Ndoh, Tina [Ndoh.Tina@epa.gov]; Herbolsheimer, Courtney [herbolsheimer.courtney@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; caitlin.weact@gmail.com; Bhandari, Pradnya [Bhandari.Pradnya@epa.gov]; Jantz-Sell, Taylor [Jantz-Sell.Taylor@epa.gov]; Sasser, Erika [Sasser.Erika@epa.gov]; Wesson, Karen [Wesson.Karen@epa.gov]; Terry, Sara [Terry.Sara@epa.gov]; Efron, Brent [Efron.Brent@epa.gov]; lonnie.weact@gmail.com; taylor.weact@gmail.com; jose.bravo.jta@gmail.com

**Subject:** Environmental Justice Leaders Monthly Engagement Call

**Location:** [https://](#) **Ex. 6 Personal Privacy (PP)**

**Start:** 6/16/2021 6:00:00 PM

**End:** 6/16/2021 7:30:00 PM

**Show Time As:** Tentative

**Recurrence:** Monthly  
the third Wednesday of every 1 month(s) from 2:00 PM to 3:30 PM

**Required Attendees:** Levy, Maxwell; Enobakhare, Rosemary

**Optional Attendees:** ejcoalition.michigan@gmail.com; vmiller-travis@metgroup.com; alogan@oxy.edu; beverlyw@dscej.org; beverlywright@gmail.com; Hiltonkelley5011@gmail.com; pamela@akaction.org; Vi@akaction.org; miya@apen4ej.org; President@blackmillennials4flint.org; glinson@caleja.org; CEJCoalition@gmail.com; newbian8@verizon.net; nsheats@tesu.edu; blauderdale@earthlink.net; dmolina@cbecal.org; moniqueh@dscej.org; mroberts@comingcleaninc.org; DianeT@environmentalhealth.org; djwil51@gmail.com; ientomg@gmail.com; jose.bravo.jta@gmail.com; jose@just-transition.org; kwasserman@lvejo.org; jnwomack1@yahoo.com; tljslc@gmail.com; AliM@nwf.org; newalphacdc@gmail.com; Leownaconsulting@gmail.com; huy@opalpdx.org; poder.austin@gmail.com; mychaljohnson@gmail.com; jinemexico@gmail.com; Ana.parras@yahoo.com; parras.juan@gmail.com; Harambee@gmail.com; swilson2@umd.edu; elizabeth@uprose.org; kerene@weact.org; peggy@weact.org; Na'Taki Jelks; wera1usa@gmail.com; interfaith.earth@yahoo.com; drrobertbullard@gmail.com; scharoldmitchell@gmail.com; kteglad@aol.com; kteglad51@gmail.com; Fine, Philip; McMichael, Nate; Wieder, Jessica; Cherepy, Andrea; Wood, Anna; Tina Ndoh; Herbolsheimer, Courtney; Kim, Eunjung; Carbonell, Tomas; Nunez, Alejandra; caitlin.weact@gmail.com; Bhandari, Pradnya; Jantz-Sell, Taylor; Sasser, Erika; Wesson, Karen; Terry, Sara; Efron, Brent; lonnie.weact@gmail.com; taylor.weact@gmail.com

## June Monthly Environmental Justice Call

### Topics:

- Purpose and goals of the monthly call
- EPA's 2022 – 2026 Strategic Plan
- Equity Taskforce Outreach



- Clean Air Act (CAA) List of Air Toxics Addition of 1-Bromopropane (1-BP) Engagement
- Public Listening Sessions on Upcoming Oil and Natural Gas Methane Rule
- Reconsidering the previous administration’s decision to retain the particulate matter (PM) National Ambient Air Quality Standards (NAAQS)
- ENERGY STAR Home Upgrade Program

*This monthly meeting with members of the environmental justice community is held for the purpose of exchanging information and gathering facts. EPA is not soliciting group or collective advice. Any advice provided to EPA during these meetings should be on behalf of yourself or the organization you represent, not the collective.*

Join ZoomGov Meeting

https:// Ex. 6 Personal Privacy (PP)

Meeting ID: Ex. 6 Personal Privacy (PP)

One tap mobile

Ex. 6 Personal Privacy (PP) US (San Jose)  
US

Dial by your location

Ex. 6 Personal Privacy (PP)	US (San Jose)
	US
	US (New York)
	US (San Jose)

Meeting ID: Ex. 6 Personal Privacy (PP)

Find your local number Ex. 6 Personal Privacy (PP)

Join by SIP

Ex. 6 Personal Privacy (PP) sip.zoomgov.com

Join by H.323

Ex. 6 Personal Privacy (PP)	(US West)
	(US East)

Meeting ID: Ex. 6 Personal Privacy (PP)

## Appointment

---

**From:** Alisa Petersen [apetersen@rmi.org]  
**Sent:** 7/2/2021 9:54:14 PM  
**To:** Alisa Petersen [apetersen@rmi.org]; Bailey, Ann [Bailey.Ann@epa.gov]; Bryson, Joe [Bryson.Joe@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Hurst, Nicholas [hurst.nicholas@epa.gov]; Lupinacci, Jean [Lupinacci.Jean@epa.gov]; Molina, Maggie [Molina.Maggie@epa.gov]; Snyder, Carolyn [Snyder.Carolyn@epa.gov]

**Subject:** EPA/RMI ENERGY STAR Discussion

**Location:** https://**Ex. 6 Personal Privacy (PP)**

**Start:** 7/9/2021 5:00:00 PM

**End:** 7/9/2021 6:00:00 PM

**Show Time As:** Busy

**Recurrence:** (none)

### Agenda:

- Intros
- Update from EPA (10 min)
- Building electrification priorities from RMI and others (10 min)
- Discussion
- 

Call-in Info:

https://**Ex. 6 Personal Privacy (PP)**

Meeting ID **Ex. 6 Personal Privacy (PP)**

One tap mobile

**Ex. 6 Personal Privacy (PP)**

## Appointment

---

**From:** Alisa Petersen [apetersen@rmi.org]  
**Sent:** 7/2/2021 9:51:01 PM  
**To:** Bailey, Ann [Bailey.Ann@epa.gov]; Bryson, Joe [Bryson.Joe@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Hurst, Nicholas [hurst.nicholas@epa.gov]; Lupinacci, Jean [Lupinacci.Jean@epa.gov]; Molina, Maggie [Molina.Maggie@epa.gov]; Snyder, Carolyn [Snyder.Carolyn@epa.gov]

**Subject:** EPA/RMI ENERGY STAR Discussion

**Location:** https:// **Ex. 6 Personal Privacy (PP)**

**Start:** 7/9/2021 5:00:00 PM

**End:** 7/9/2021 6:00:00 PM

**Show Time As:** Tentative

**Recurrence:** (none)

### Agenda:

- Intros
- Update from EPA (10 min)
- Building electrification priorities from RMI and others (10 min)
- Discussion
- 

Call-in Info:

https:// **Ex. 6 Personal Privacy (PP)**

Meeting ID: **Ex. 6 Personal Privacy (PP)**

One tap mobile

**Ex. 6 Personal Privacy (PP)**

Message

---

**From:** Alisa Petersen [apetersen@rmi.org]  
**Sent:** 7/9/2021 5:02:49 PM  
**To:** Mark Kresowik [mkresowik@rmi.org]; Brady Seals [bseals@rmi.org]; Jim Dennison [jdennison@rmi.org]; Denise Grab [dgrab@rmi.org]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Snyder, Carolyn [Snyder.Carolyn@epa.gov]; Lupinacci, Jean [Lupinacci.Jean@epa.gov]; Bailey, Ann [Bailey.Ann@epa.gov]; Passe, Jonathan [Passe.Jonathan@epa.gov]; Molina, Maggie [Molina.Maggie@epa.gov]; Hurst, Nicholas [hurst.nicholas@epa.gov]; Bryson, Joe [Bryson.Joe@epa.gov]; Conlin, Beth [Conlin.Beth@epa.gov]  
**CC:** Nancy Seidman [nseidman@raponline.org]; Emily Beagle [ebeagle@rmi.org]; Rachel Golden [rachel.golden@sierraclub.org]; rer8@nyu.edu; Dana Johnson [dana@weact.org]; Caitlin Buchanan [caitlin@weact.org]; Andres Restrepo [andres.restrepo@sierraclub.org]; Amneh Minkara [amneh.minkara@sierraclub.org]; Lienke, Jack [lienkej@mercury.law.nyu.edu]; assmus.phil@epa.gov; Assmus, Phillip [Assmus.Phillip@epa.gov]  
**Subject:** Re: EPA/RMI ENERGY STAR Discussion

I'm sorry the zoom ID is not working. Please use this one instead:

https://**Ex. 6 Personal Privacy (PP)**

Meeting ID **Ex. 6 Personal Privacy (PP)**

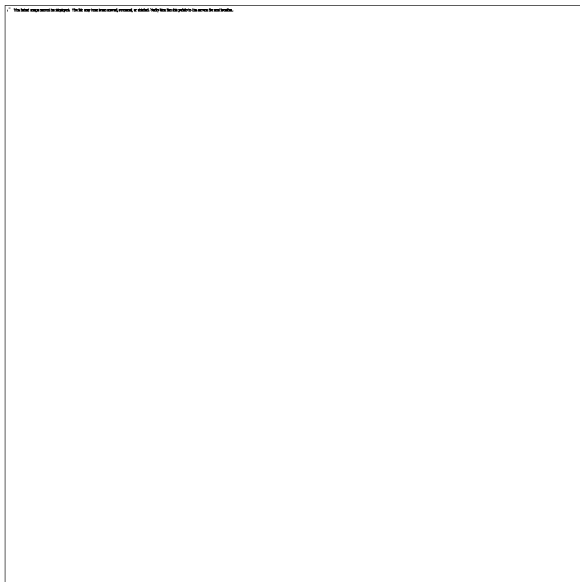
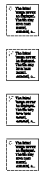
One tap mobile

**Ex. 6 Personal Privacy (PP)**



Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)  
| 1850 M Street NW Suite 280 | Washington, DC



\*Why do pronouns matter?

**From:** Alisa Petersen

**Sent:** Monday, June 7, 2021 5:33 PM

**To:** Mark Kresowik <mkresowik@rmi.org>; Brady Seals <bseals@rmi.org>; Jim Dennison <jdennison@rmi.org>; Denise Grab <dgrab@rmi.org>; Tomas <Carbonell.Tomas@epa.gov>; Snyder, Carolyn <Snyder.Carolyn@epa.gov>; Jean <Lupinacci.Jean@epa.gov>; Ann <Bailey.Ann@epa.gov>; Passe, Jonathan <Passe.Jonathan@epa.gov>; Maggie <Molina.Maggie@epa.gov>; Nicholas <hurst.nicholas@epa.gov>; Joe Bryson <Bryson.Joe@epa.gov>; Conlin, Beth <Conlin.Beth@epa.gov>

**Cc:** Nancy Seidman <nseidman@raponline.org>; Emily Beagle <ebeagle@rmi.org>; Rachel Golden <rachel.golden@sierraclub.org>; rer8@nyu.edu <rer8@nyu.edu>; Dana Johnson <dana@weact.org>; Caitlin Buchanan <caitlin@weact.org>; Andres Restrepo <andres.restrepo@sierraclub.org>; Amneh Minkara <amneh.minkara@sierraclub.org>; Lienke, Jack <lienkej@mercury.law.nyu.edu>; assmus.phil@epa.gov <assmus.phil@epa.gov>; Assmus.Phillip@epa.gov <Assmus.Phillip@epa.gov>

**Subject:** EPA/RMI ENERGY STAR Discussion

**When:** Friday, July 9, 2021 12:00 PM-1:00 PM.

**Where:** <https://> **Ex. 6 Personal Privacy (PP)**

**Agenda:**

- Intros
- Update from EPA (10 min)
- Building electrification priorities from RMI and others (10 min)
- Discussion
- 

**Call-in Info:**

<https://> **Ex. 6 Personal Privacy (PP)**

Meeting ID **Ex. 6 Personal Privacy (PP)**

One tap mobile

**Ex. 6 Personal Privacy (PP)**

## Appointment

---

**From:** Levy, Maxwell [Levy.Maxwell@epa.gov]  
**Sent:** 6/15/2021 6:17:50 PM  
**To:** Enobakhare, Rosemary [Enobakhare.Rosemary@epa.gov]  
**CC:** ejcoalition.michigan@gmail.com; vmiller-travis@metgroup.com; Angelo Logan [alogan@oxy.edu]; Beverly Wright [beverlyw@dscej.org]; beverlywright@gmail.com; Hiltonkelley5011@gmail.com; pamela@akaction.org; Viola Waghiyi [vi@akaction.org]; miya@apen4ej.org; LaTricea Adams [president@blackmillennials4flint.org]; glinson@caleja.org; CEJCoalition@gmail.com; newbian8 [newbian8@verizon.net]; nsheats@tesu.edu; blauderdale@earthlink.net; dmolina@cbecal.org; moniqueh@dscej.org; mroberts [mroberts@comingcleaninc.org]; DianeT@environmentalhealth.org; djwil51@gmail.com; ientomg@gmail.com; jose.bravo.jta@gmail.com; jose@just-transition.org; kwasserman@lvejo.org; jnwomack1@yahoo.com; tljslc@gmail.com; AliM@nwf.org; newalphacdc@gmail.com; Leownaconsulting@gmail.com; huy@opalpdx.org; poder.austin [poder.austin@gmail.com]; mychaljohnson@gmail.com; jinemexico@gmail.com; Ana.parras@yahoo.com; parras.juan@gmail.com; Harambee@gmail.com; swilson2 [swilson2@umd.edu]; elizabeth@uprose.org; kerene@weact.org; peggy@weact.org; Na'Taki Jelks [nojelks@wawa-online.org]; wera1usa@gmail.com; interfaith.earth@yahoo.com; drrobertbullard [drrobertbullard@gmail.com]; scharoldmitchell [scharoldmitchell@gmail.com]; ktegland@aol.com; ktegland51@gmail.com; Fine, Philip [Fine.Philip@epa.gov]; McMichael, Nate [McMichael.Nate@epa.gov]; Wieder, Jessica [Wieder.Jessica@epa.gov]; Cherepy, Andrea [Cherepy.Andrea@epa.gov]; Wood, Anna [Wood.Anna@epa.gov]; Ndoh, Tina [Ndoh.Tina@epa.gov]; Herbolsheimer, Courtney [herbolsheimer.courtney@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; caitlin.weact@gmail.com; Bhandari, Pradnya [Bhandari.Pradnya@epa.gov]; Jantz-Sell, Taylor [Jantz-Sell.Taylor@epa.gov]; Sasser, Erika [Sasser.Erika@epa.gov]; Wesson, Karen [Wesson.Karen@epa.gov]; Terry, Sara [Terry.Sara@epa.gov]

**Subject:** Environmental Justice Leaders Monthly Engagement Call  
**Location:** <https://> **Ex. 6 Personal Privacy (PP)**

**Start:** 6/16/2021 6:00:00 PM  
**End:** 6/16/2021 7:30:00 PM  
**Show Time As:** Tentative

**Recurrence:** Monthly  
the third Wednesday of every 1 month(s) from 2:00 PM to 3:30 PM

**Required Attendees:** Enobakhare, Rosemary

**Optional Attendees:** ejcoalition.michigan@gmail.com; vmiller-travis@metgroup.com; alogan@oxy.edu; beverlyw@dscej.org; beverlywright@gmail.com; Hiltonkelley5011@gmail.com; pamela@akaction.org; Vi@akaction.org; miya@apen4ej.org; President@blackmillennials4flint.org; glinson@caleja.org; CEJCoalition@gmail.com; newbian8@verizon.net; nsheats@tesu.edu; blauderdale@earthlink.net; dmolina@cbecal.org; moniqueh@dscej.org; mroberts@comingcleaninc.org; DianeT@environmentalhealth.org; djwil51@gmail.com; ientomg@gmail.com; jose.bravo.jta@gmail.com; jose@just-transition.org; kwasserman@lvejo.org; jnwomack1@yahoo.com; tljslc@gmail.com; AliM@nwf.org; newalphacdc@gmail.com; Leownaconsulting@gmail.com; huy@opalpdx.org; poder.austin@gmail.com; mychaljohnson@gmail.com; jinemexico@gmail.com; Ana.parras@yahoo.com; parras.juan@gmail.com; Harambee@gmail.com; swilson2@umd.edu; elizabeth@uprose.org; kerene@weact.org; peggy@weact.org; Na'Taki Jelks; wera1usa@gmail.com; interfaith.earth@yahoo.com; drrobertbullard@gmail.com; scharoldmitchell@gmail.com; ktegland@aol.com; ktegland51@gmail.com; Fine, Philip; McMichael, Nate; Wieder, Jessica; Cherepy, Andrea; Wood, Anna; Tina Ndoh; Herbolsheimer, Courtney; Kim, Eunjung; Carbonell, Tomas; Nunez, Alejandra; caitlin.weact@gmail.com; Bhandari, Pradnya; Jantz-Sell, Taylor; Sasser, Erika; Wesson, Karen; Terry, Sara

## June Monthly Environmental Justice Call

### Topics:

- Purpose and goals of the monthly call
- EPA's 2022 – 2026 Strategic Plan
- Equity Taskforce Outreach

- Clean Air Act (CAA) List of Air Toxics Addition of 1-Bromopropane (1-BP) Engagement
- Public Listening Sessions on Upcoming Oil and Natural Gas Methane Rule
- Reconsidering the previous administration’s decision to retain the particulate matter (PM) National Ambient Air Quality Standards (NAAQS)
- ENERGY STAR Home Upgrade Program

*This monthly meeting with members of the environmental justice community is held for the purpose of exchanging information and gathering facts. EPA is not soliciting group or collective advice. Any advice provided to EPA during these meetings should be on behalf of yourself or the organization you represent, not the collective.*

Join ZoomGov Meeting

https://**Ex. 6 Personal Privacy (PP)**

Meeting ID: **Ex. 6 Personal Privacy (PP)**

One tap mobile

**Ex. 6 Personal Privacy (PP)** US (San Jose)  
US

Dial by your location

**Ex. 6 Personal Privacy (PP)** US (San Jose)  
US  
US (New York)  
US (San Jose)

Meeting ID: **Ex. 6 Personal Privacy (PP)**

Find your local number: **Ex. 6 Personal Privacy (PP)**

Join by SIP

**Ex. 6 Personal Privacy (PP)**@sip.zoomgov.com

Join by H.323

**Ex. 6 Personal Privacy (PP)** US West)  
US East)

Meeting ID: **Ex. 6 Personal Privacy (PP)**

Message

---

**From:** Lena Moffitt [lena@evergreenaction.com]  
**Sent:** 1/12/2023 7:16:02 PM  
**To:** Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Cortez Russell, Loni [Russell.Loni@epa.gov]; Profeta, Timothy [Profeta.Timothy@epa.gov]; Enobakhare, Rosemary [Enobakhare.Rosemary@epa.gov]; Goffman, Joseph [Goffman.Joseph@epa.gov]  
**CC:** Krasnow, Sam [SKrasnow@nrdc.org]; Sam Ricketts [sam@evergreenaction.com]; Charles Harper [charles@evergreenaction.com]; Dani Hupper [dani@evergreenaction.com]  
**Subject:** Embargoed: Evergreen + NRDC Joint Report "Powering Toward 100% Clean Power by 2035"  
**Attachments:** Evergreen-NRDC Clean Power Paper 230106 (2).pdf

Hi All,

Happy new year. Please find attached an embargoed copy of Evergreen Action and NRDC's joint report, *Powering Toward 100% Clean Power by 2035*, outlining how we can achieve this critical goal of the Administration's through key efforts by your agency (and others). We wanted to give you a heads up before its public release on January 23rd (to be followed by an event with Senator Smith on January 24th at 4pm est). We are updating the paper text in the next few days to reflect the timeline changes announced in the fall Unified Agenda. Please let us know if you have any thoughts or questions.

Best,

--

Lena Moffitt | Chief of Staff  
(505) 480-1551  
@LenaMDC  
*Pronouns: she/her*







# Powering Toward 100 Percent Clean Power by 2035

The Path to Carbon-Free Electricity  
After the Inflation Reduction Act

---

By: Charles Harper, Sam Krasnow, Leah Stokes,  
Lissa Lynch, Sam Ricketts, Amanda Levin, Daniela  
Schulman, Jeff Slyfield, Christy Walsh

January 2023

# Table of Contents

## **Executive Summary**

### **1. Introduction: Taking Stock of the Transition**

- 1.1 Confronting the Climate Crisis with Clean Electricity
- 1.2 Legislative Progress on Clean Electricity
- 1.3 The Clean Electricity Gap

### **2. A Federal Pathway to Progress: EPA, FERC, and other Executive Branch Actions**

- 2.1 EPA Regulations
- 2.2 Federal Energy Regulatory Commission (FERC)
- 2.3 Implementation of the Inflation Reduction Act and the Infrastructure Investment and Jobs Act
- 2.4 Other Executive Branch Actions

### **3. State Leadership: An Action Plan for State Lawmakers and Advocates**

- 3.1 State 100 Percent Clean Electricity Standards
- 3.2 The Role of Public Utility Commissions and Utilities
- 3.3 State-level Efforts to Advance a Just Transition
- 3.4 Taking Full Advantage of Federal Support for Clean Electricity

### **4. Conclusion**

# Acknowledgements

---

The authors thank Rachel Patterson, Dani Hupper, Lena Moffitt, and Justin Balik from Evergreen Action; David Doniger and John Walke from NRDC; Wes Gobar from the BlackOak Collective; Jason Walsh and Thom Kay from the BlueGreen Alliance; Jamie DeMarco and Quentin Scott from Chesapeake Climate Action Network; Conrad Schneider, Hayden Hashimoto, Angela Seligman, Ann Weeks, Alan Masinter, Jay Duffy, Emily Tucker, Stacey Davis, Alex Breckel, Jeanette Pablo, and Jeremy Tarr from Clean Air Task Force; Tom Matzzie from CleanChoice Energy; Maddie Page from the Climate Action Campaign; Neil Gormley, Seth Johnson, Christine Powell, Erin Overturf, Gavin Kearney, and Jill Tauber from Earthjustice; Dan Esposito, Robbie Orvis, and Mike O'Boyle from Energy Innovation; Doug Scott from the Great Plains Institute; Rob Gramlich from Grid Strategies; Russell Armstrong from the Hip Hop Caucus; Lashelle Johnson from the League of Conservation Voters; Theresa Landrum from the Original United Citizens of Southwest Detroit; Dallas Burtraw from Resources for the Future; and Olivia Quinn from UC Santa Barbara for their comments.

# Executive Summary

President Joe Biden entered office with a commitment to the American people: that the United States would achieve 100 percent clean, carbon-free electricity by 2035. Clean electricity is essential to America's response to the climate crisis. And reaching 80 percent clean power by 2030 is key to achieving the U.S. economy-wide goal of at least halving carbon pollution this decade.

Decarbonizing the power sector is a major task requiring both federal legislative and executive action. Accordingly, the Biden Administration has promised a whole-of-government response that includes robust performance standards, significant investment, and a commitment to justice. The U.S. took an important step on clean energy investment in 2022, when Congress and President Biden enacted the Inflation Reduction Act (IRA). This historic climate legislation contains over \$370 billion in investments towards building America's clean energy economy.

However, according to new modeling in this report, the U.S. must take further action to meet its energy goals this decade. The IRA's investments are projected to increase carbon-free electricity in the U.S. from approximately 40 percent in 2022 to 66 percent clean power by 2030. This falls short of the 80 percent target that's consistent with the path to 100 percent clean electricity by 2035. The bill is also estimated to help cut economy-wide greenhouse gas (GHG) pollution to 40 percent below 2005 levels by 2030—an important step, but short of America's 50–52 percent commitment under the Paris Agreement.

To close the gaps between our climate and clean power targets and our current trajectory, and to further advance President Biden's critical climate and environmental justice commitments, the Biden Administration must take decisive executive action to cut pollution and advance clean electricity in the power sector over the next two years. More states must also continue to step up and lead on 100 percent clean energy.

To stay within reach of 100 percent clean electricity by 2035 and address harmful pollution from fossil generation, the U.S. must:

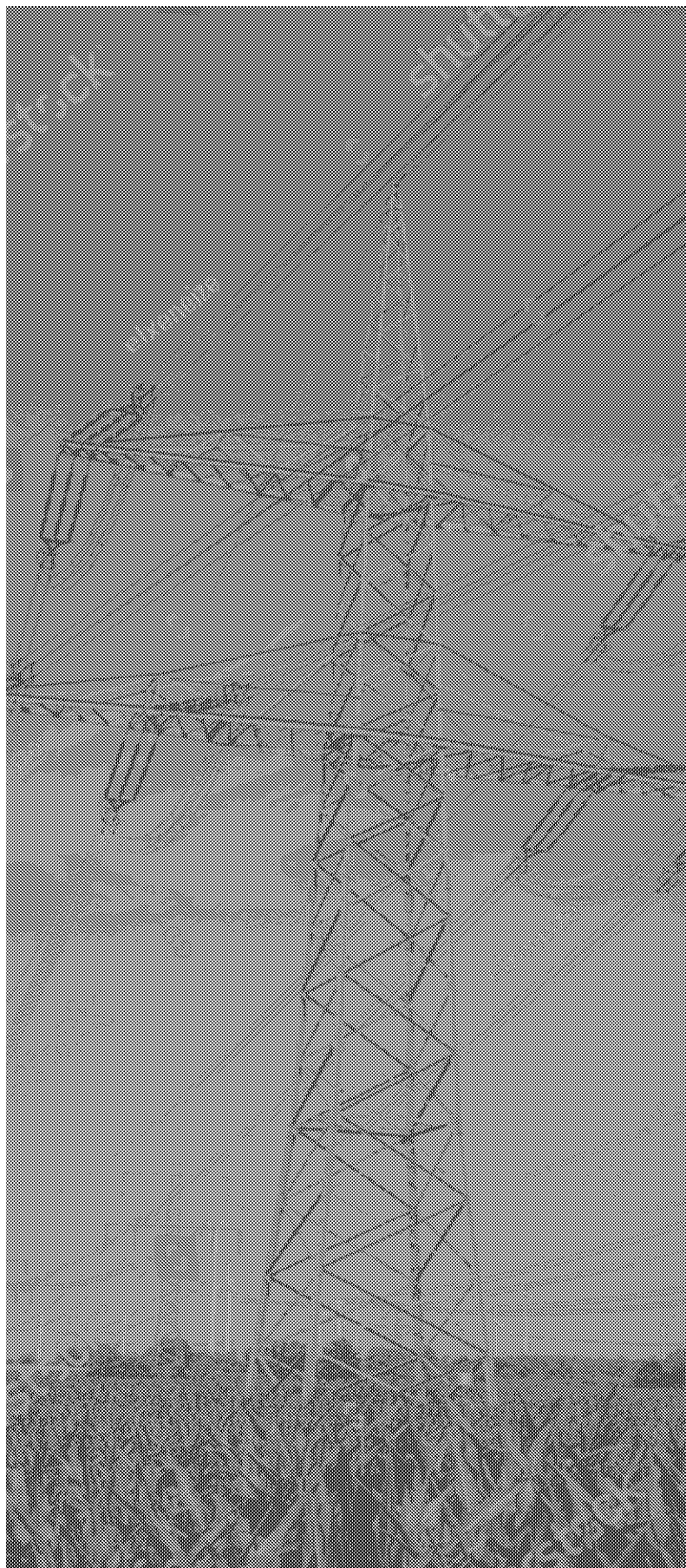
- **Set ambitious carbon pollution standards for new and existing power plants** under the Clean Air Act, through the Environmental Protection Agency (EPA), and set EPA pollution standards that reduce traditional air and water pollutants and improve public health;
- **Expand transmission capacity, speed interconnection, and create market parity for clean energy** at the Federal Energy Regulatory Commission (FERC);
- **Implement the Inflation Reduction Act effectively**, with timely federal guidance on the IRA's tax credits and grant programs and the distribution of funds in a way that maximizes carbon reductions and equitable economic opportunity; and
- **Advance climate action at the state level**, including through accelerated 100 percent clean electricity and pollution standards that align with 80 percent clean power by 2030 and heightened oversight of polluting utilities.

New modeling in this paper from the Natural Resources Defense Council (NRDC) finds the Biden Administration can take action over the next two years that will

put 80 percent clean energy by 2030 within reach—in line with President Biden’s goals. This modeling shows that strong carbon standards for power plants in combination with the IRA could cut power-sector carbon pollution up to 70–77 percent below 2005 levels, and achieve up to a 76 percent clean grid by the end of this decade.

Add in other robust action from the federal executive branch, plus accelerated state policy, and the President’s goal is in sight.

This paper outlines a roadmap towards 80 percent clean power by 2030 and 100 percent clean electricity by 2035, building off of the passage of the IRA. With two years remaining in his first term, President Biden must continue to fill out his agenda using standards, investments, and justice to tackle the climate crisis and build a thriving, just, and inclusive clean energy economy.



# 1. Introduction: Taking Stock of the Transition

## 1.1 Confronting the Climate Crisis with Clean Electricity

President Joe Biden took office in January 2021 with a commitment to the American people: that the United States would achieve 100 percent clean, carbon-free electricity by 2035. We must meet this goal by rapidly advancing toward a clean energy future to prevent the worst impacts of climate change.

Cleaning up the electricity sector is the linchpin of an economy-wide decarbonization strategy. The power sector produced 25 percent of U.S. GHG pollution in 2020. Further, the path to cleaning up other sectors of the economy—including transportation, buildings, and some industrial sub-sectors—relies heavily on clean electrification. Reducing pollution in the power sector is therefore key to decarbonizing nearly all areas of the economy: clean electricity combined with electrification could ultimately cut 70 to 80 percent of current U.S. GHG pollution. Electricity represents the best opportunity to achieve the United States’s near-term international pledge of a 50–52 percent reduction in GHG pollution by 2030. Pollution from the power sector also overwhelmingly impacts disadvantaged communities—low-income communities and communities of color that suffer disproportionate burdens of pollution and disinvestment—which means that cleaning up the power sector is a significant opportunity to advance environmental justice.

Decisive action this decade is paramount to achieve President Biden’s goal of 100 percent carbon-free electricity by 2035. A crucial first-order goal is to achieve 80 percent clean power by 2030.<sup>1</sup> To meet these clean energy commitments, the Biden administration must take critical steps over the next two years: setting pollution standards for the power sector under existing laws, pursuing grid reforms to facilitate clean energy deployment, and effectively implementing the IRA and other new federal legislation. State leadership, too, is vital: states have laid the foundation for a 100 percent clean power future and must now continue their leadership and ratchet up their ambition.

Achieving 80 percent clean power by 2030 could deliver massive economic gains, including job creation, GDP growth, and energy cost reductions for American consumers. Investing in energy efficiency at the same time as increasing clean power will boost affordability and reliability. Acting on climate is popular, too. A 2021 poll from Data for Progress found that 70 percent of voters think America should take “ambitious actions to address climate change” and lead the world in reducing its climate pollution.

Reducing power sector pollution would also create massive benefits for public health. Reducing deadly air pollutants like soot, smog, and mercury, can prevent hundreds of thousands of premature deaths in the

U.S. Air pollution from the power sector is also a key driver of environmental injustice. Eliminating this pollution can help reduce the disproportionate health impact of pollution that low-income and communities of color have borne for decades.

These benefits will only be realized if the administration takes concerted action. While the IRA will put the country on a path to cutting GHG pollution by about 40 percent below 2005 levels this decade, this cut still falls short of President Biden's goal of reducing GHG pollution by 50–52 percent. In short, there is a gap. This paper lays out the additional policies and actions in the power sector that can help close the pollution gap and make progress toward achieving our country's climate, clean air, and environmental justice goals.

## 1.2 Legislative Progress on Clean Electricity

In August 2022, Congress passed and President Biden signed the IRA into law, the largest investment in clean energy and climate action in U.S. history. This builds off of success in 2021, when Congress and President Biden enacted the \$1.2 trillion Infrastructure Investment and Jobs Act (IIJA) and the CHIPS and Science Act, focused on technological innovation and U.S. manufacturing. These three bills together mark a massive investment towards building America's clean energy economy.

The IRA's climate investments are projected to reduce GHG pollution well beyond any other policy passed by Congress or implemented under executive authority. These investments—in clean energy tax credits, energy efficiency, energy storage, building electrification, clean manufacturing, climate-smart agriculture, and more—are

projected to reduce economy-wide GHG emissions around 40 percent below 2005 levels by 2030, compared to 25 percent below 2005 levels without the law, according to modeling by Energy Innovation.<sup>2</sup> The IRA will deliver major progress towards the 50–52 percent GHG emissions cut by 2030 that the United States has pledged in its Nationally Determined Contribution (NDC) under the Paris Agreement. But it will not fully meet that goal.

In addition, the IIJA is making historic investments toward repairing and building new transportation infrastructure, expanding access to clean drinking water and broadband internet, and, critically, improving our nation's electricity transmission system. The CHIPS and Science Act, meanwhile, focuses on building regional economic clusters and stepping up U.S. investment in technology research and innovation. Together, the IRA, IIJA and the CHIPS and Science Act deliver on a transformational agenda to invest in building a more just, thriving and inclusive clean energy economy.

Now, these laws must be implemented efficiently, effectively, and equitably. Federal agencies, including the Treasury, the Department of Energy (DOE), and EPA should ready themselves to deploy these new funds and programs to maximize policy impact. These investments must be implemented in line with the administration's Justice40 initiative, prioritizing benefits in disadvantaged communities. Section 2.3 of this paper provides a more detailed look at the importance of policy implementation for the clean power transition, and outlines the role of the federal government in that effort.

Even assuming all three laws should be successfully implemented, a gap remains between our climate and clean power targets

<sup>2</sup> The range in estimates is between 37 to 43 percent below 2005 levels by 2030, with a central estimate of 39 percent.

and our current trajectory. This gap calls for action by future Congresses, especially to advance provisions that were left on the IRA's cutting room floor, like a Transmission Investment Tax Credit and a Clean Electricity Standard (CES)—or something akin to the Clean Electricity Performance Program (CEPP) that could be consistent with budget reconciliation. Congress should return to these issues, as highlighted by the December 2022 capstone report released by the House of Representatives Select Committee on the Climate Crisis. Federal legislators may also continue to debate changes in permitting systems related to the deployment of transmission and clean energy infrastructure.

Even as new federal legislation has delivered critical investments towards achieving 100 percent clean electricity by 2035, additional federal policy action is essential to fulfilling that goal. Fortunately, additional federal policy action is possible, even without further timely action from Congress.

## 1.3 The Clean Electricity Gap

While the power sector has historically demonstrated the most progress on achieving emissions reductions, it remains the second largest source of climate pollution in the U.S., emitting 1.55 billion metric tons of carbon dioxide (CO<sub>2</sub>) in 2021—approximately 32 percent of U.S. CO<sub>2</sub> emissions. Eliminating power sector carbon pollution through clean electrification is the cornerstone to decarbonizing the economy by 2050. As cleaner energy technologies have become more cost-effective and the dirtiest power plants have shuttered their doors, carbon emissions from the power sector have already fallen significantly, alongside other public health pollutants. Since 2005, carbon pollution from the power sector has declined by 33 percent. Still, much more can and must be done. Reaching 80 percent clean power this decade is essential to achieving both our 2030 NDC target and President Biden's campaign promise of 100 percent clean



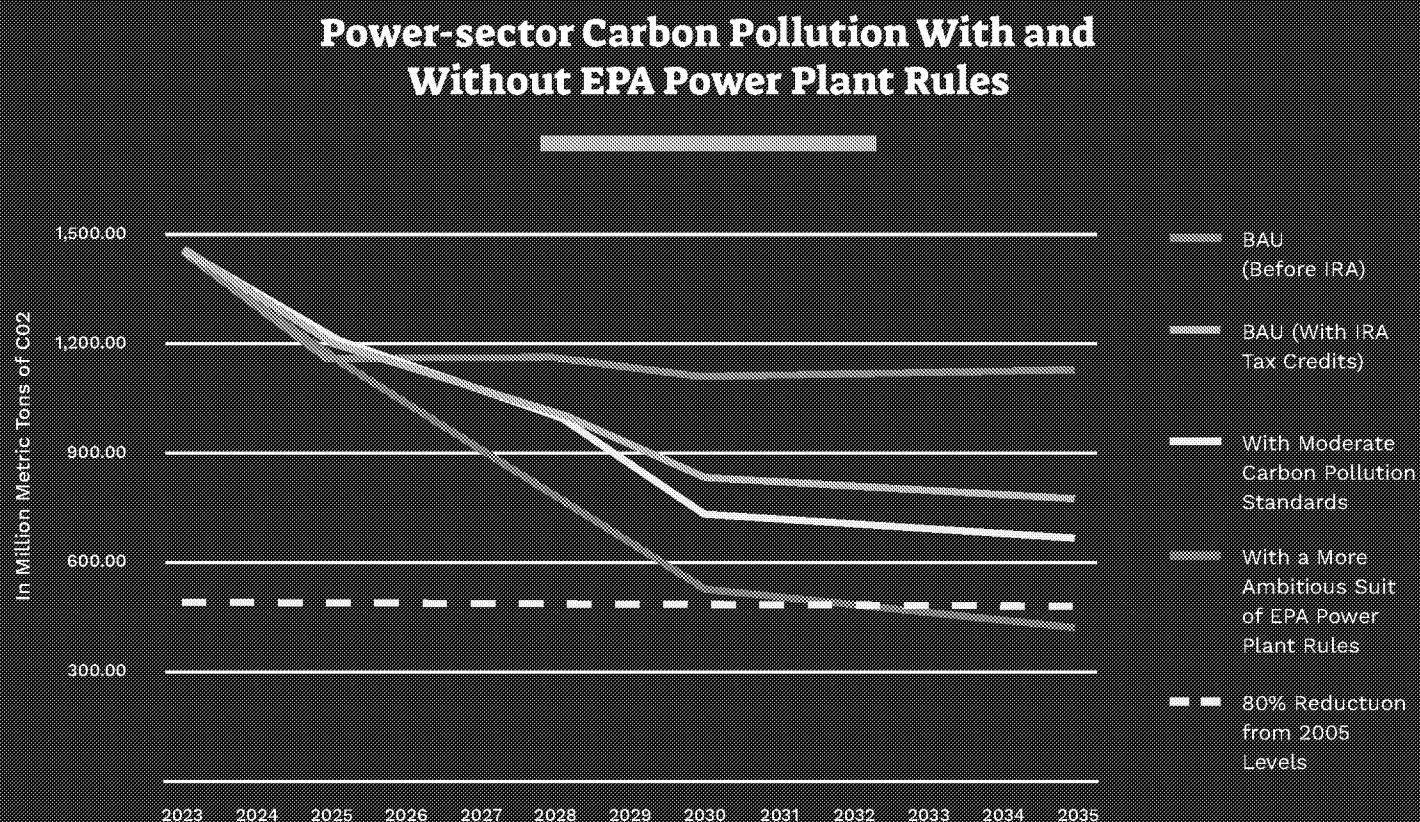


power by 2035. Meeting this goal, however, will require additional action at all levels.

Modeling from NRDC finds that the tax incentives, grants, and other provisions of the IRA can bring down power sector carbon emissions to 66 percent below 2005 levels by 2030 (Figure 1). The IRA also directs EPA to issue new carbon pollution standards for power plants, and the law's incentives dramatically reduce the cost of such standards for power companies and their customers. As fossil-fueled power shrinks,

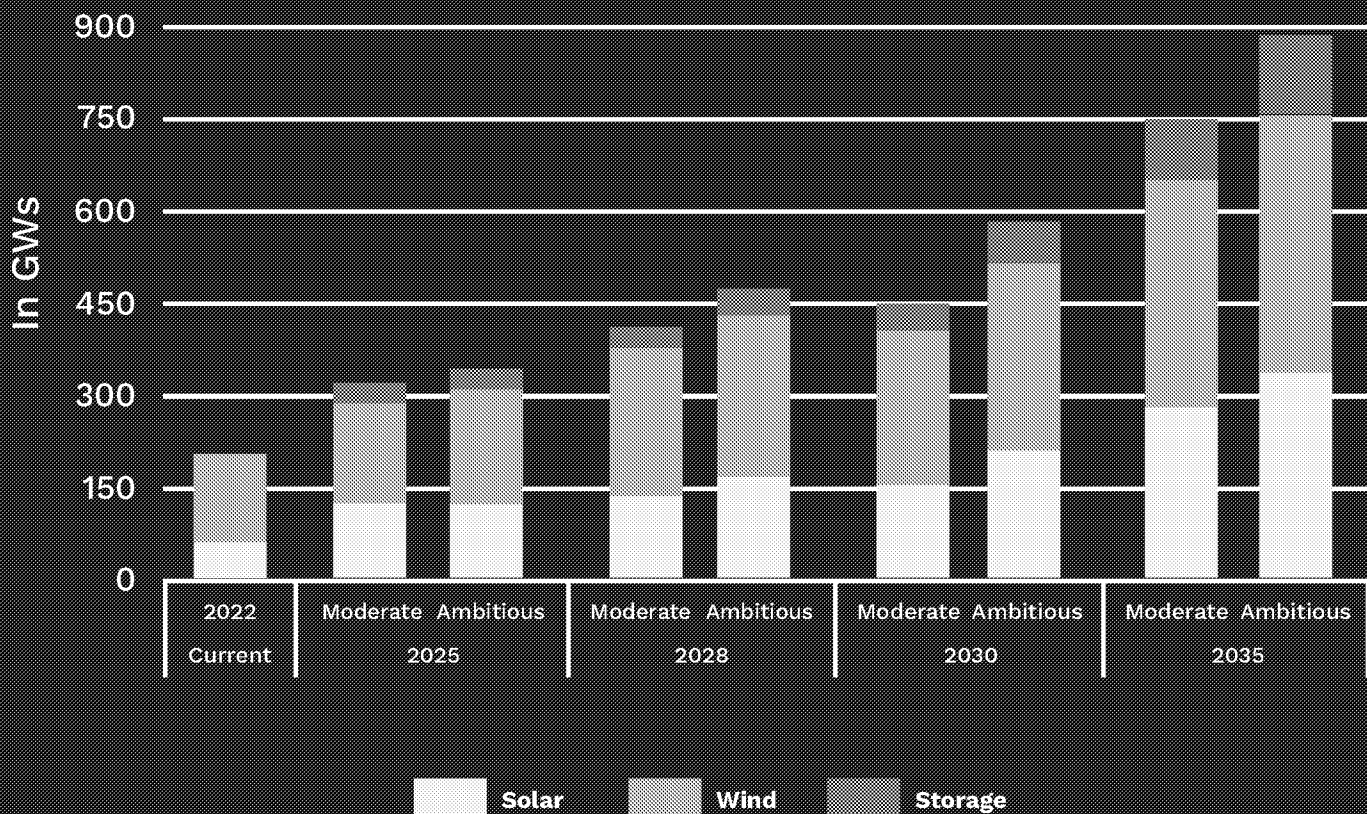
renewable energy sources can grow. Under an ambitious policy scenario, the U.S. could see nearly 900 gigawatts (GW) of renewable and storage capacity operating nation-wide by 2035 (Figure 2). **Pairing the IRA with strong EPA carbon standards for power plants, the Biden Administration could cut power sector carbon pollution up to 77 percent below 2005 levels and achieve up to a 76 percent clean grid by the end of this decade.**

Combining bold federal executive action with accelerated state policy puts President



**Figure 1:** Total U.S. power sector emissions under various scenarios, including Business-as-Usual (BAU) before the IRA, BAU with the IRA clean energy tax credits, and two scenarios that include either the IRA plus moderate carbon pollution standards for power plants (which includes standards for new gas and existing coal plants) or the IRA plus more ambitious power plant carbon standards (which also includes a standard on existing gas plants).

## Cumulative Renewable Energy Capacity, With Varying EPA Rules



**Figure 2:** Cumulative installed capacity of solar, wind, and storage through 2035 under two scenarios. These scenarios include moderate power plant carbon pollution standards (inclusive of IRA tax credits) and more ambitious power plant carbon standards (inclusive of IRA tax credits), illustrating that renewable capacity could roughly triple from 2022 to 2030 and quadruple from 2022 to 2035. For reference, total installed capacity from all generation sources was 1080 GW in 2021.

## 2. A Federal Pathway to Progress: EPA, FERC, and other Executive Branch Actions

To close the gap between current policies and those necessary to achieve our climate, clean power, and public health goals, President Biden must take bold executive actions over the next two years. These fall into four primary categories:

1. Issue stringent new pollution standards at the Environmental Protection Agency (EPA).
2. Finalize new rules addressing transmission and power markets at the Federal Energy Regulatory Commission (FERC).
3. Ensure efficient, equitable and effective implementation of the IRA and IIJA.
4. Take other executive branch actions to deploy clean energy.

### 2.1 EPA Regulations

In the 1960s the environmental movement gained attention due to the clear evidence of harmful pollution, from oil spills to flaming rivers and deadly smog. The sitting president, Richard Nixon, responded to public concerns by recommending the development of a new agency, the EPA, to monitor and reduce pollution through regulations, and conduct research on emerging threats to the environment and public health. Since its creation in 1970, EPA has grown and been tasked with both abating pollution from specific sources, such as power plants, and

regulating specific pollutants in air, water and communities that impact public health and contribute to environmental degradation.

EPA has long-standing legal authority to regulate sources of air, water, and other pollution under key environmental laws, including the Clean Air Act (CAA), the Clean Water Act (CWA), and the Resource Conservation and Recovery Act (RCRA). Through these laws, Congress has charged the agency with protecting the environment and public health by limiting pollution that is produced within states and that crosses state lines. The CAA is a foundational law that has successfully protected Americans from air pollution for 50 years. CAA regulations have prevented hundreds of thousands of premature deaths, while also supporting economic growth by promoting technological innovation. The CWA protects water sources from raw sewage and toxic waste contamination by controlling water pollution with wastewater standards. RCRA has long protected communities from exposure to hazardous sources of solid waste, including in the transportation, storage, and disposal of waste. These three laws can and should now be enforced in a coordinated manner to maximize pollution reductions from the electricity sector and promote the health and welfare of American communities.

EPA should act quickly to execute an agenda that harmonizes many of the regulations authorized through the CAA, CWA and RCRA

in a multi-pollutant strategy to decrease pollution from the power sector, as called for in a letter sent by NRDC, Evergreen, and other environmental organizations to EPA Administrator Michael Regan in April 2021. In March 2022, Administrator Regan indicated that EPA would move forward with such a coordinated, multi-pollutant approach to addressing power plant pollution. However, EPA is falling behind its own schedule on

nine out of ten crucial rules. Without further concerted effort, the agency risks leaving this crucial business undone at the end of the first term. Issuing final rules in the months before the 2024 election also leaves them open to possible repeal by the Congressional Review Act, meaning EPA could not issue any rule “substantially the same” without new legislation.

Appliance	Fall 2021 Regulatory Agenda Target Date	Spring 2022 Regulatory Agenda Target Date	Current Status
CO <sub>2</sub> Standards for New Plants	Proposal June 2022	Proposal March 2023	On track for March 2023 Proposal
CO <sub>2</sub> Rules for Existing Plants	Proposal July 2022	Proposal March 2023	On track for March 2023 Proposal
PM <sub>2.5</sub> (Soot) NAAQS	Proposal August 2022	Proposal August 2022	Delayed
Ozone (Smog) NAAQS	n/a	Proposal April 2023	Unknown - currently under CASAC science review
Mercury & Air Toxics Standards - Risk and Technology Review	Proposal June 2022	Proposal February 2023	On track for February 2023 Proposal
Good Neighbor Plan	Proposed March 2022	Final March 2023	On track for March 2023 Final Rule
Regional Haze Rule	No plans to strengthen rule announced		
Startup Shutdown and Malfunction - Affirmative Defense Removal	Final July 2022	Final August 2022	Delayed
Coal Ash Legacy Impoundments Rules	Proposal September 2022	Proposal November 2022	Delayed
Effluent Limitation Guidelines	Proposal November 2022	Proposal November 2022	Delayed: Proposal now expected January 2023



Missed 2021 and 2022 target dates

Missed 2021 but on track for 2022 target date



On track for 2021 target date

## 1. CAA Power Plant Pollution Reduction Rules for New and Existing Sources

The Clean Air Act, as amended by the IRA, directs EPA to establish limits on CO<sub>2</sub> from new and existing fossil fuel-fired power plants. Under CAA Section 111(b), EPA sets New Source Performance Standards (NSPS) for new plants. These standards limit the amount of air pollution that can be emitted by a newly built plant. Existing sources are regulated under Section 111(d)—for those, EPA must issue Emission Guidelines, which set emission limits for existing plants and direct states to develop plans for the existing power plants in their state to meet EPA's emission limits.

For both new and existing plants, standards must be based on the emission reductions achievable by the “best system of emission reduction” (BSER) that is available to the plants, as evaluated by EPA on a technical basis. EPA's considerations for new plants, which are designed with the latest technology, may be somewhat different from those for existing plants, which are already in operation and must reduce their current emissions.

EPA first issued power plant CO<sub>2</sub> Section 111 rules in 2015 under the Obama administration. The 2015 Section 111(b) NSPS for new coal plants is based on a BSER that includes partial carbon capture and sequestration (CCS); the standard for new gas plants is based on efficient combined cycle technology. Although the NSPS was challenged in court, the litigation has yet to be completed and the standard remains in effect. While the Trump EPA proposed to amend the NSPS in 2018, it never finalized the proposal, leaving the 2015 standard in place.

The 2015 Section 111(d) rule for existing fossil plants, known as the Clean Power Plan (CPP), was based on the emission reductions achievable through the replacement of dirtier generation with cleaner generation, for example through building zero-emitting renewable generation to replace a retiring coal plant. The CPP was challenged in court and stayed by the Supreme Court before it could be implemented.

In 2019 the Trump administration repealed the CPP and replaced it with a new rule based on minor improvements to coal plants' operating efficiency. Litigation challenging the CPP repeal culminated in the Supreme Court's recent decision in *West Virginia v. EPA*, which constrained—but did not eliminate—EPA's Section 111(d) authority. The Court held that EPA may not base Section 111(d) emission limits on the reductions that could be achieved by replacing dirtier fossil generation with cleaner generation, as EPA had done in the CPP.

Now, EPA must proceed with new rulemakings that conform to *West Virginia v. EPA*'s constraints, by setting standards based on technology that causes individual plants to “operate more cleanly.” Such standards could be based on the emission reductions achievable through improvements to the operating efficiency of the plant; co-firing with a cleaner fuel, such as co-firing coal with gas, or gas with hydrogen; or installing CCS. Although EPA must set the level of the standard based on pollution-control measures that can be installed at the plant itself (sometimes called “inside-the-fenceline” measures), states and companies will have flexibility to determine how best to meet the standard—which may include other measures such as ramping down fossil plant generation and investing in zero-emitting generation.

EPA has said that new proposed rules under both 111(b) and 111(d) will be released by March 2023.

Relying on adequately demonstrated and cost-reasonable technologies that conform to the mandates of *West Virginia v. EPA*, such as CCS, emission reductions of 90 percent are achievable for both coal-fired and gas-fired power plants. Since significant carbon abatement is possible using inside-the-fence measures, EPA's 111(b) NSPS for new gas plants and 111(d) Emission Guidelines for existing coal and gas plants can and must require substantial carbon pollution reductions.

NRDC's modeling projects that rules reflecting just partial application of such measures could reduce power sector carbon emissions by 77 percent from 2005 levels by 2030 (see Figure 1).

It is important that EPA build upon the standards that have existed for new coal-fired power plants since 2015 by setting limits for all three remaining types of plants: new gas plants, existing coal plants, and existing gas plants. **Rules that only address existing coal and new gas facilities but neglect existing gas plants would leave more than half of the potential emissions reductions on the table**—achieving only a 70 percent emissions

cut by 2030, instead of 77 percent, according to NRDC modeling.<sup>3</sup>

The Biden administration must move with urgency on these standards—issuing draft rules in March 2023, as it has committed to do, and publishing a final rule for all three rules: 111(b) for new gas, 111(d) for existing coal, and 111(d) for existing gas by December 2023. If the deadline of a final rule by December 2023 is not met, EPA risks leaving these crucial measures unfinalized at the end of President Biden's first term.

## 2. CAA Air Quality Rules

In addition to its important legal obligations under the CAA to limit carbon pollution from power plants, EPA must also take bold steps to confront a range of other traditional and hazardous air pollutants under the statute. These rules are critical for better protecting Americans' health and advancing environmental justice in communities already overburdened by pollution. These rules will also have the co-benefit of further reducing carbon pollution.

### National Ambient Air Quality Standards (NAAQS)

The CAA requires EPA to establish standards for certain major air pollutants, called “criteria pollutants,” that endanger public health and welfare. These pollutants are ground-level ozone, particulate matter (PM, commonly known as soot), carbon monoxide, lead, sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>2</sub>), which each contribute to the formation of smog. The CAA regulates all of these pollutants under the National Ambient Air Quality Standards (NAAQS) program, due to the health impacts and welfare (crop and ecosystem) harms they cause, including impaired lung function, heart

<sup>3</sup> See Figure 1 in Section 1.3 of this paper—and the difference between the Moderate and Ambitious scenarios therein—for an illustration of this difference.

and lung diseases, and even premature death. Power plants are a leading source of many of the criteria pollutants.

The NAAQS must be reviewed by EPA every five years to ensure that the standards are informed by the most up-to-date science and continue to adequately protect public health and welfare. After evaluating the scientific evidence and the health risks of exposure to each pollutant, EPA determines whether it is necessary to update or revise the standards. The Trump administration failed to update any of the NAAQS, leaving the NO<sub>2</sub> and SO<sub>2</sub> standards unchanged for over a decade. In 2021, EPA stated its intent to reconsider the Trump administration's last-minute decisions to maintain the 2012 standards for fine particulate matter (PM<sub>2.5</sub>), as well as the 2015 ozone standards.

We strongly urge EPA to accelerate the rulemaking process for both of these reconsiderations, given the extensive research demonstrating the health risks of exposure to PM<sub>2.5</sub> and ozone, so that final versions of each rule are released this year. **EPA should set the new annual health standard for PM<sub>2.5</sub> at no greater than 8 micrograms per cubic meter and set the 24-hour health standard at no greater than 25 micrograms per cubic meter. EPA should set the new ozone health standard at a level no higher than 60 parts per billion (ppb).** The agency should also act to address the public welfare and ecosystem effects of this pollution by ensuring that the secondary standards are set at the same levels as the primary standards for both pollutants. Leading medical organizations and EPA's own science advisors have identified these lower standards for ozone and PM as necessary to protect public health.

As the remaining criteria pollutant standards come up for review in the coming years, we urge EPA to expedite the processes for

strengthening regulations to protect the public from these pollutants. In an effort to provide transparency for stakeholders, EPA should proactively announce rulemakings for all outstanding and upcoming reviews of standards for the other criteria pollutants.

### **Mercury and Air Toxics Standards (MATS)**

In 2000, EPA determined that it was "appropriate and necessary" to limit emissions of hazardous air pollutants like mercury, arsenic, benzene, and cadmium emitted from power plants that burn coal and oil. The resulting Mercury and Air Toxics Standards (MATS) require coal- and oil-fired power plants producing 25 MW or more of electricity to use control technologies to limit these hazardous air pollutants. Since they took effect in 2015, the MATS safeguards have reduced mercury emissions from coal-fired power plants by more than 90 percent. Upon adoption of the standards, coal-fired power plants were the largest industrial source of mercury pollution, which increases heart attack risks, compromises immune function, and damages developing fetuses, especially for vulnerable populations.

Despite the appropriate and necessary finding being well-supported in 2012 and reaffirmed in 2016, the Trump administration reversed the 2016 finding using flawed methods of review—knowingly leaving the safeguards vulnerable to lawsuits by coal companies, which followed immediately. Under the Biden administration, EPA is now in the process of restoring the appropriate and necessary finding, reaffirming the need for the MATS safeguards. EPA has also announced plans to initiate a rulemaking on the MATS Risk and Technology Review which should demonstrate that current emissions control technologies and practices are not adequately protecting public health and limiting adverse environmental impacts. The results of the Risk and Technology Review should result in more protective standards,

which are still sorely needed in communities and ecosystems suffering from excessive hazardous air pollution from power plants. **EPA must quickly finalize restoration of the appropriate and necessary finding, undertake a thorough review of available pollution control technologies and practices, and strengthen standards to limit mercury and air toxics** emitted from coal- and oil-fired power plants.

#### **Good Neighbor Rule (Ozone Transport)**

EPA also monitors and regulates transboundary interstate pollution to ensure that states downwind of pollution are not overburdened by poor air quality due to emissions originating in upwind states. Since the mid-1990s, EPA has issued several generations of “cross-state” air pollution rules that have regulated SO<sub>x</sub> and NO<sub>x</sub> emissions from coal-burning electric power plants that contribute to the formation of ground-level ozone (smog) by setting pollution limits and budgets for power plants in the responsible upwind states.

The goal of regulating emissions across state lines is to ensure all states are responsible for controlling air pollution sources that cause or contribute to violations of NAAQS health standards, whether in their own states or other states. Currently 27 states across the eastern U.S. must comply with the latest versions of these rules, the Cross-State Air Pollution Rule (CSAPR) and its updates, to limit either SO<sub>2</sub> or NO<sub>x</sub> emissions that contribute to the formation of ozone pollution. Ground level ozone is a lung irritant that most impacts children and individuals with existing respiratory illnesses. The Obama administration reviewed and updated the NAAQS ozone health standard in 2015, but the Trump administration failed to require the needed reductions from pollution sources in upwind states to enable downwind states to meet the stronger standard.

The Biden EPA has proposed a new Good Neighbor rule to further reduce NO<sub>x</sub> emissions from coal-burning power plants in 25 upwind states and other industrial sources in 23 upwind states, to help meet the 2015 ozone health standard. **This Good Neighbor rule is already overdue, so the Biden EPA should finalize the proposed rule by its own March 2023 deadline to restore common sense policies that protect communities from pollution.** Furthermore, once EPA strengthens the ozone NAAQS in a new rulemaking—as we advocate above—the agency should act quickly to ensure that upwind states reduce their pollution in line with the new health standard.

#### **Regional Haze Rule**

EPA also ensures that Americans get to enjoy the natural beauty of national parks and wilderness areas. For over 20 years, EPA has worked with the National Park Service, the U.S. Fish and Wildlife Service, and the U.S. Forest Service to implement air quality protection plans to reduce pollution that impairs visibility in designated national parks and wilderness areas, also known as haze. Haze is a visual representation of air pollution that comes primarily from power plants, vehicles and heavy industry. Particulate matter is a major cause of haze, and it develops as a result of chemical reactions from pollutants like SO<sub>2</sub> and NO<sub>x</sub>. By regulating power plant pollution, visibility in natural parks and wilderness areas will improve.

EPA has identified 156 national parks and wilderness areas as “Mandatory Class I Areas” that are protected through the Regional Haze Rule, primarily concentrated in the western part of the country. States with Mandatory Class I Areas must produce implementation plans that address regional haze by identifying and tracking sources of emissions and using appropriate emissions control measures. States and Tribes submitted the first regional



haze State Implementation Plans (SIPs) to EPA in 2008, with periodic revisions due every 10 years. However, the Trump administration extended the 2018 revision to 2021, and gave power plant operators and states permission to forgo more effective available control technologies. The Biden administration is now attempting to correct these rollbacks through clarified guidance.

EPA is currently reviewing SIPs submitted in July 2021; **39 states have failed to submit revised regional haze SIPs at all, despite the requirements of the CAA and the Regional Haze Rule. EPA must uphold the law and promulgate Federal Implementation Plans for these states.** The Biden administration should move to protect our national parks and wilderness areas by revising the Regional Haze Rule to drive greater pollution reductions from power plants.

#### **Startup Shutdown and Malfunction (SSM) Policy**

Power plants and other industrial sources often emit higher levels of air pollution during periods of startup, shutdown, and malfunction (SSM). As EPA has long recognized, these emissions can harm nearby communities. However, many EPA and state clean air protections have loopholes that allow power plants to emit excess air pollution during SSM periods without facing legal consequences.

In 2008 and 2014 the courts determined that SSM exemptions from regulations governing hazardous air pollutants violate the CAA. The Obama administration responded to these court rulings by clarifying and updating EPA's SSM policy in 2015 and ordering 36 states to update their SIPs to comply with the CAA. The Trump administration rolled back the 2015 update with revised guidance, and allowed North Carolina, Texas and Iowa to retain the loopholes in their SIPs.

The Biden administration has since reinstated the 2015 SSM policy, and is revoking the Trump EPA's approved exemptions for three states' SIPs. EPA is further requiring 12 more states that failed to remove the loopholes to correct their state plans, or become subject to a Federal Implementation Plan. EPA also plans to remove a closely related "emergency affirmative defense" loophole—which could allow industrial polluters like power plants to avoid liability for violating emissions limits—from its regulations. EPA should promptly finalize these proposed actions and **move to close any remaining SSM loopholes in EPA's clean air safeguards** to protect all communities from illegal, excessive emissions.

### **3. Water Quality and Solid Waste Rules**

#### **Closing Coal Ash Disposal Loopholes**

Pollution from coal-fired power plants not only affects air quality, it also has lasting impacts on groundwater quality and drinking



water safety. Coal ash, the waste product of burning coal to produce electricity, contains toxic chemicals including mercury, arsenic, and cadmium. Coal ash is typically disposed of in pits, ponds, or landfills, many of which are unlined because they were constructed prior to EPA regulations. Toxic coal ash leaks from these pits into the soil and groundwater, causing severe health impacts such as cancer, birth defects, and kidney and heart disease in nearby communities. Toxic coal ash sites are most often located in low-income communities and communities of color, resulting in disproportionate negative health outcomes for these communities. Coal ash is a leading source of water contamination in the U.S.: 91 percent of the coal ash ponds that report data are polluting groundwater with toxic chemicals that exceed federal standards for safe drinking water, according to a November 2022 report by the Environmental Integrity Project and Earthjustice.

The Obama administration first regulated the disposal of coal ash in 2015 under RCRA, establishing minimum criteria for existing and new coal ash facilities, including groundwater monitoring. Subsequent litigation led to additional rulemaking that required unlined coal ash ponds that contaminated groundwater to stop receiving coal waste, or retrofit or close operations by 2021. The Trump administration weakened the initial rule by allowing extensions for compliance deadlines and suspending groundwater monitoring requirements. Now the Biden administration is enforcing the coal ash rule for the first time since the rules were promulgated, by denying compliance extension requests or requiring compliance from coal-fired power plants with leaking and dangerous coal ash ponds.

**EPA must address the widespread harm caused by coal ash disposal by eliminating exemptions from safeguards**—currently, about half of all coal ash waste in the U.S. remains unregulated, amounting to half a

billion tons. In 2022, EPA announced its plans to **issue a new coal ash rule addressing legacy storage ponds**—coal ash impoundments at power plants that were inactive at the time of the 2015 rule. While this is a step in the right direction, **this new rule needs to cover all types of facilities exempted from the 2015 rule.** Updating the coal ash rule to eliminate these exemptions would increase protections for millions of Americans who are at risk of exposure to dangerous coal ash through their drinking water.

### **Effluent Limitation Guidelines**

Coal-fired power plants also generate wastewater that poisons rivers and streams, carrying toxic chemicals through American waters. Coal-fired steam electric power plants are a major source of water pollution, dumping millions of tons of toxic metals like lead, arsenic, and mercury into waterways every year. EPA regulates this wastewater discharge under the CWA through the Effluent Limitation Guidelines. These guidelines use technology-based standards to regulate water pollution across many industries and cover over 100 priority pollutants, including those discharged by power plants. Strict regulation of power plants' wastewater will reduce exposure to harmful pollutants and improve the aquatic environment.

The Obama administration issued the first Effluent Limitation Guidelines for power plants in 2015. The Trump administration weakened the rules in 2020, allowing for exemptions and extending compliance deadlines. In 2021, the Biden administration reviewed the Trump-era standards and committed to a new rulemaking. **EPA is expected to issue a new proposal updating the Effluent Limitation Guidelines in early 2023 (having missed its original November 2022 deadline);** until a new rule is finalized, the insufficiently-protective 2015 and 2020 rules remain in effect and toxic coal plant wastewater will continue to pollute our streams and rivers.

It is imperative that EPA act quickly to update the Effluent Limitation Guidelines using currently available science and technology to better protect the public from toxic heavy metals—and at the same time not allow further delays in the deadlines to implement these long-overdue public health protections.

## 2.2 Federal Energy Regulatory Commission (FERC)

The Federal Energy Regulatory Commission (FERC) also has an essential role to play in powering towards 100 percent clean electricity for America.

The Federal Power Act provides FERC with the authority to ensure that clean energy has equal access to wholesale power markets, and that there is sufficient transmission to get clean energy to consumers. Lack of sufficient transmission is a major bottleneck to the large levels of clean energy deployment necessary to reach our national goals for clean energy and economy-wide decarbonization—especially now that the IRA has made wind and solar the cheapest source of new power in the country.

FERC action in 2023 and 2024 is therefore key to achieving these targets. FERC must exercise its regulatory authority over utilities to reform planning in two key areas: transmission and interconnection, and resource adequacy.

### The Need to Confirm a Fifth Commissioner

To implement these reforms effectively, the Commission needs a full slate of five commissioners. Former Chair Rich Glick's term expired at the end of 2022, leaving FERC split 2-2 between Democratic and Republican appointees. **President Biden**

**and the U.S. Senate must confirm a new FERC commissioner quickly** so that the Commission can address its transmission and resource adequacy priorities at full strength. While some of the rules detailed below could possibly advance through a 2-2 FERC, a strong climate and clean energy majority on FERC is essential to finalizing the strongest rules possible. President Biden and the Senate must prioritize this vacancy. Without a fully-staffed FERC able to finalize much-needed rules reforming transmission planning, interconnection, and power markets, many of the climate benefits enabled by the IRA would be left unrealized. Other priorities, including intervenor compensation to boost public participation, might also go undone.

### Transmission and Interconnection

FERC must reform transmission planning to better plan for new generating resources, many of which are clean, low-cost renewables sited far from the areas where electricity load is concentrated. Large-scale regional and interregional transmission will be needed to bring this clean energy to consumers. A recent study by the Princeton REPEAT Project found that high-voltage transmission needs to expand at a rate of 2.3 percent per year to achieve the full carbon reduction potential of the IRA, similar to the historical rate of expansion from 1978–2020 (~2 percent)—but far beyond the 1 percent annual expansion this last decade. Further, as extreme weather becomes more common, large interregional transmission lines can allow a region suffering from extreme weather to import power from its neighbors, providing needed reliability and resilience to keep the lights on.

FERC's current transmission planning rules provide perverse incentives for transmission owners to plan the system to meet local, rather than regional, needs. Because of this, data show that most transmission is built outside

of regional planning processes in regional transmission organizations (RTOs). In non-RTO regions, regional transmission planning is essentially nonexistent. Transmission projects planned outside of the regional transmission planning process are not subject to meaningful review. Interregional coordination processes, in particular, have been unsuccessful, with no meaningful interregional transmission developed to date.

One successful example of regional planning is in the Midwest, where the Midcontinent Independent System Operator (MISO) approved in July 2022 the largest investment in transmission lines ever in the United States. This opens the door to an estimated 53 gigawatts (GW) of new wind and solar energy, renewables plus storage and battery projects—enough to power 12 million homes. According to the [Union of Concerned Scientists](#), this transmission will prevent 400 million metric tons of carbon emissions between 2030 and 2050. Moreover, it's good for consumers—providing, on average, \$2.60 in benefits for every dollar spent. However, additional policy action will be required to realize these gains. The approved lines will now go to states for approval, where the fights to get these built will get tougher and localized. Additionally, MISO still has three more tranches of transmission lines to approve in the next few years, including building lines in the South and expanding the connection between MISO North and MISO South. Even these tranches will not be sufficient to meet the need: there is a total of 112 GW of clean energy and storage sitting in the MISO interconnection queue and many fossil fuel plants retiring in the coming years. However, the leadership MISO is showing on transmission is a critically important start.

This kind of progress can be replicated in the other areas of the country. In April 2022, FERC issued a [proposed rule](#) to improve

regional transmission planning. This rule would require RTOs to conduct long-term, forward-looking scenario planning to meet the needs driven by changes in the resource mix and consumer demand. In the proposed rule, FERC outlined the multiple benefits of transmission development, but did not require transmission planners to actually plan for these benefits. **FERC needs to move forward quickly with a final regional transmission rule that requires transmission regions to plan for a minimum set of benefits.** While this proposed rule did not include a requirement to plan large, interregional lines, several FERC Commissioners indicated in public statements that they are still considering reforms to interregional planning, too.

This is the first time in a decade that FERC is reviewing its transmission planning rules. FERC needs to be bold to finalize rules that spur the transmission desperately needed for reliability, for resilience, and to bring clean energy resources onto the grid. FERC must finalize its regional transmission planning rule, and then issue a rule addressing interregional transmission, too. An interregional planning rule should address minimum transfer capability requirements, which FERC is [publicly considering](#) and which would spur a minimum level of transmission capacity between grid regions. However, **the Commission should go further and reform interregional transmission planning and cost allocation more comprehensively**, as its April 2022 proposed rule would for regional transmission.

To meet our emissions reduction goals, we must also ensure that clean energy can be connected to the grid. Right now, there are over [8,100 active projects](#) in interconnection queues, totalling 1,000 GW of generation and 400 GW of storage. Projects currently take an average of 3.7 years to get through the interconnection queue, and only 23 percent

of generators ultimately make it all the way through. Getting even a fraction of this power, which is mostly clean energy, onto the grid faster would help ensure reliability and resilience, and reduce consumer costs by allowing access to low-cost power sources. In June 2022, FERC proposed rules to streamline the processing of projects in the interconnection queue, reforms that could help get more solar, wind and storage connected to electric grids nationwide. Rather than considering interconnection requests one-by-one, as occurs now, FERC's proposal would require a "first-ready, first-served cluster study process" that groups projects together and prioritizes those closest to commercial operation.

**FERC needs to move quickly to finalize these interconnection rules** so that the thousands of solar, wind and storage projects waiting for approval can get connected to the grid. FERC's rule should include strict deadlines for interconnection studies and fines for utilities and transmission providers that fail to meet them. Without FERC dramatically reforming the interconnection process, the U.S. has little hope of meeting its clean energy and climate targets. The grid operator in the Mid Atlantic, PJM, recently proposed (and FERC reluctantly approved) reforms designed to start working through the backlog of wind and solar projects trying to connect to the grid. However, even if these reforms work as planned, PJM is unlikely to be able to connect projects quickly enough to meet the state clean energy goals already on the books. FERC must finalize a new interconnection rule quickly so that the Commission can begin to reject inadequate proposals like PJM's.

## Resource Adequacy

Resource adequacy is the process of ensuring that sufficient supply of electricity is available at all times. It is a jurisdictionally complex

field, with intertwined federal, state, and private roles. Roughly 142 million Americans live in regions where FERC-jurisdictional rules, known as "capacity markets," play a key role in maintaining resource adequacy. Each year, these rules direct the collection of billions of dollars from electricity consumers to support power plants and other electricity-sector resources. FERC-jurisdictional capacity market rules must be reformed to adapt to the changing technologies of a low-carbon power system, and to remove explicit barriers to state clean energy policy.

Between 2016 and 2020, FERC implemented a series of rules that aim to preempt state energy policy by limiting how resources subsidized by state or local policy are considered in capacity markets. These rules—PJM's Minimum Offer Price Rule (MOPR), New England ISO's Competitive Auctions with Sponsored Policy Resources, and New York ISO's Buyer-Side Mitigation (BSM)—have the effect of protecting fossil-fueled resources, especially gas-fired combined cycle power plants, from competition with state-supported energy resources, typically clean energy. More recently, FERC has begun to roll these rules back—although these actions will not take effect until 2025 in the case of New England, after that region's grid operator requested and FERC approved a two-year transition period. FERC must hold New England's grid operator accountable to this deadline with no further delays and should move expeditiously to ensure that capacity market rules designed to undermine state energy policies are entirely replaced as quickly as possible.

More generally, resource adequacy rules have been designed for the characteristics of traditional power plants, and are in need of reforms to accurately reflect an increasingly low-carbon grid. Accuracy is paramount: resource adequacy planning must both ensure that the power system remains reliable as

it transitions to new sources of supply and allow clean resources to displace fossil resources to the maximum extent consistent with maintaining reliability.

In particular, current resource adequacy rules are designed around power plants that are dispatchable, available at most times, and located nearby. In contrast, some clean sources of electricity operate differently, with limits on when they are available and how much power they can produce. Many resource adequacy constructs also assume fossil resources can provide electricity at all times, when time after time it has been shown that they struggle in extreme heat and cold. Currently, resource adequacy rules are overly conservative in assessing what grid services low-carbon sources of electricity can provide, essentially punishing renewables and electric storage for their characteristics while not acknowledging the ways newer resources, particularly energy storage, can be more responsive than fossil generation. FERC should address these issues by reforming market rules so that they:

- Accurately consider the resource adequacy value of all technologies instead of setting arbitrary limits on participation and using accreditation methods that undervalue clean energy resources.
- Allow for resource adequacy to be achieved through combinations of complementary resources, such as demand-side management combined with renewables.
- Incorporate the effects of flexible and price-responsive load.
- Recognize diurnal and seasonal differences in need for and supply of power.
- Remove barriers to interregional trade in capacity.

FERC and the regional transmission organizations (RTOs) are currently removing

some of the hidden subsidies for fossil fuels and barriers to renewable energy from electricity market rules. In April 2022, FERC issued an order that required each of the RTOs to comprehensively assess their current system needs over the next 5–10 years given recent changes in resource mixes and load profiles, and detail how they plan to reform their markets to meet expected system needs. FERC explicitly required that market reforms cannot discriminate against any type of generation. This proceeding put pressure on the RTOs to make sure that their markets appropriately value new clean energy resources and flexible demand and continue to serve load reliably. FERC also indicated that it may use the information it received to propose further market reforms. At a minimum, FERC must use the information provided by the RTOs to ensure that they allow all resources that are technically capable of providing ancillary services to do so, and send price signals that reflect the full value of needed services—by compensating resources for the full cost of producing and generating electricity and for being available at the right time and place. Advocates should closely follow the RTO processes that this order started to ensure the RTOs appropriately value clean energy resources and demand flexibility as more of these resources come online.



These resource adequacy rules, while important, only affect the areas currently in an RTO. Utilities in the western United States, with the exception of those in California, are not currently in an RTO. Efforts are underway to consider various market mechanisms in the West. A recent report by Advanced Energy Economy (AEE) highlights the benefits of an integrated western market, including \$2 billion in annual energy cost savings, adding up to 4.4 GW of additional clean energy to the Western grid, and adding 657,000 new permanent, high-paying jobs to the West. Advocates need to work with utilities and states in the West to move to market structures that can take advantage of these market benefits. Similarly, utilities in the southeastern United States are not in an RTO. While southeastern states have recently moved to increase competition through the Southeast Energy Exchange Market, the creation of a full RTO would drive substantial benefits. A southeastern RTO is estimated by Energy Innovation and Vibrant Clean Energy to create \$384 billion in economic savings through 2040 and to reduce customer bills and carbon emissions substantially—with retail costs 29 percent lower in 2040 compared to business as usual.

## 2.3 Implementation of the Inflation Reduction Act and the Infrastructure Investment and Jobs Act

In August 2022, Congress passed and President Biden signed the Inflation Reduction Act (IRA), the largest investment in clean energy and climate action in U.S. history. The IRA contains groundbreaking federal financial support for renewable, clean, and energy storage tax credits and other investments that will transform the nation's power grid away from fossil to clean generation.

Implementing the historic clean power provisions in the IRA, and to a smaller extent the Infrastructure Investment & Jobs Act (IIJA) and CHIPS and Science Act, will be key to decarbonizing the power sector. These laws—if implemented efficiently, effectively and equitably—can slash emissions and contribute significantly toward setting the U.S. on track to achieve 80 percent clean power by 2030, on the way to 100 percent clean by 2035. Key areas and agencies of focus in the IRA include:

- 1. Clean Energy Tax Credits:** The IRA provides long-term, full-value extension of the federal investment and production tax credits (ITC and PTC) for clean electricity generation. The credits were expanded to cover energy storage and interconnection costs, as well as to promote projects that pay prevailing wages, utilize registered apprentices and Made-in-America technologies, and benefit disadvantaged communities. The incentives are also made more accessible, with the option for non-profit utilities to receive an elective payment in lieu of a tax credit.
- 2. DOE Loan Guarantee Program:** The IRA provides \$8.6 billion for DOE clean energy loan guarantees, enabling \$290 billion in loan guarantee authority. The Loan Guarantee Program is a powerful tool for leveraging major private sector investment in clean and innovative energy technologies, especially for grid decarbonization.
- 3. USDA Rural Utilities Financing:** The IRA's \$12.8 billion for USDA financing programs will help rural communities deploy more clean energy. These funds could be used to help rural co-ops retire their coal-fired power plants through debt forgiveness, and to build out renewable energy and energy storage through grants and loans.

**4. EPA “Force Multiplier” Programs:** Including the Greenhouse Gas Accelerator, State Climate Grants, and Environmental and Climate Justice Block Grants, will be key to both emissions reductions and delivering on environmental justice through Biden’s Justice40 goals.

**5. DOE Transmission Funding:** The IIJA and IRA both contain funding for DOE to allocate grants and loans to build new transmission lines and facilitate their siting. These programs are contained within DOE’s new Grid Deployment Office.

IRA implementation will get an additional boost from programs and funding in IIJA. By boosting supply to meet higher demand for clean technology, IIJA manufacturing support programs will help deliver the best possible IRA tax incentive outcomes. For IIJA implementation, agencies must heed President Biden’s executive order setting an agenda: avoiding waste, upholding “Made-in-America” and prevailing wage requirements, equitably investing in disadvantaged communities, and partnering with State, local, and Tribal governments. This should include application of Justice40 requirements to IIJA and IRA programs.

This paper focuses on reducing pollution in the U.S. power sector. Of course, the scope of IRA climate provisions extends well beyond that. So, for the sake of clarity and concision, we chose to define the scope of discussion in this paper to the IRA provisions that directly relate to clean electricity.

## 1. Clean Energy Tax Credits

### Long-term Extension of Clean Energy Tax Credits

The IRA delivers historic support for clean power. Major new federal investment and

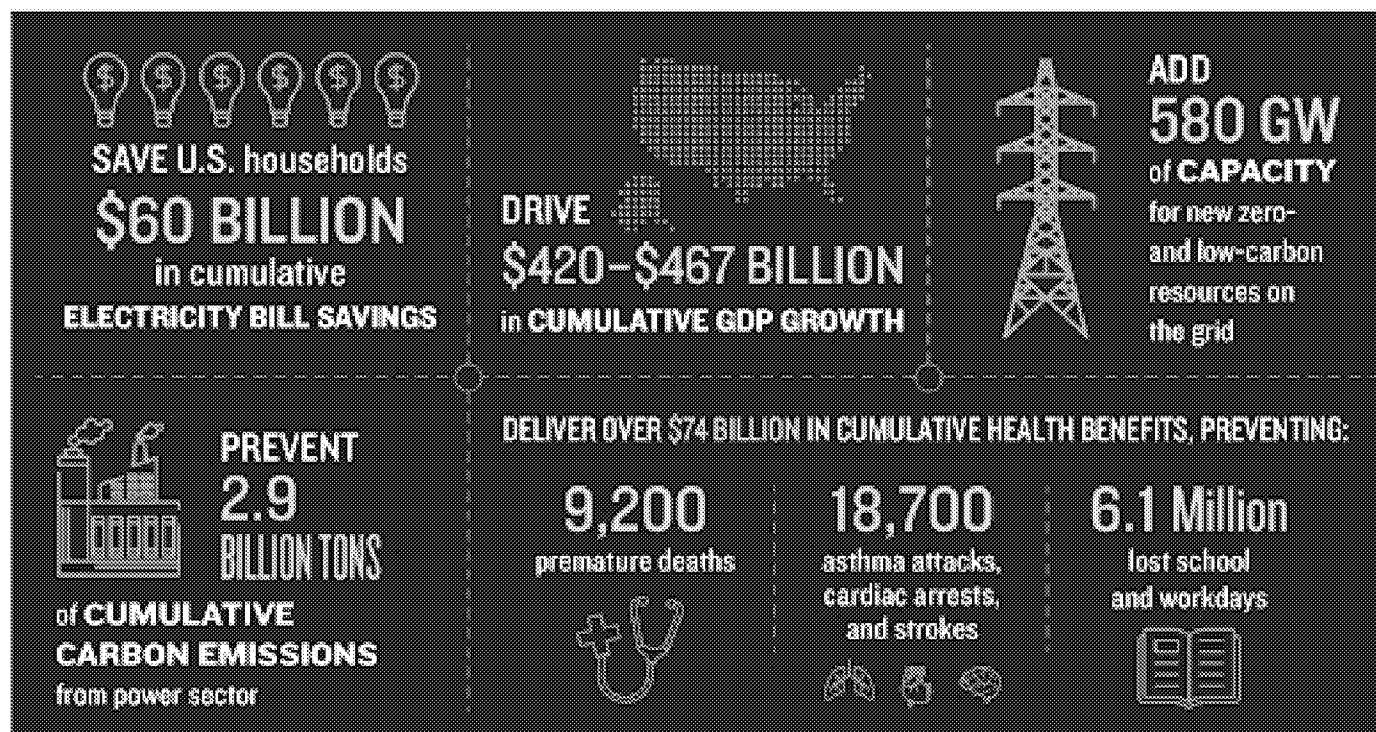
production tax credits provide the innovative, long-term support needed for power sector planning and deployment. Over the next 15 years, these tax credits are projected to cut around 2.6 billion metric tons (or 2.9 billion short tons) of carbon pollution (Figure 3). IRA clean power provisions extend wind and solar tax credits, create new technology-neutral clean energy tax credits (that include storage) and nuclear tax credits, expand carbon sequestration tax credits, and fund programs to support local clean investment.

Prior to the IRA’s passage, the solar investment tax credit (ITC) was in the process of being phased down and the wind production tax credit (PTC) had expired. Now both the ITC and PTC will get expanded and extended through 2024. Then, beginning in 2025, the solar ITC and wind PTC morph into the innovative, technology-neutral Clean Electricity Investment Credit (CEIC) and the Clean Energy Production Credit (CEPC) that can support wind, solar, geothermal, battery storage, and any new net-zero power generation technology for the next 10 years or more. Facilities can choose to take either the CEIC or the CEPC, and the credit applies to any qualified facility that begins construction through 2032, or when power sector greenhouse gas emissions fall to 25 percent of 2022 levels, whichever occurs later. This marks the first time that the duration of a tax credit has been tied to greenhouse gas targets. This climate-focused credit will support any new power generation technology that is net-zero, spurring massive deployment of existing renewables and private sector development and innovation in new power sector technologies.

In addition, throughout the tax incentives, strong labor provisions encourage high-quality jobs. These provisions include apprenticeship and prevailing wage requirements to qualify for the full tax credits (receiving only 20 percent of the credit otherwise). The base rates for the CEIC and CEPC are 6 percent and 0.3 cents per kWh, respectively. But assuming labor requirements are met, the base rate increases by 5 times to 30 percent and 1.5 cents per kWh.



## OVER THE NEXT 15 YEARS, INFLATION REDUCTION ACT CLEAN ELECTRICITY TAX CREDITS WILL:



**Figure 3:** *Estimated cumulative benefits of the IRA clean energy tax credits over the next 15 years*

Furthermore, all the clean energy credits rise in value if projects meet certain justice and just transition standards. Projects receive a 10 percent increase for locating the project in former fossil energy communities, in or near brownfield sites, or those suffering from high unemployment in fossil sectors—helping with justice and just transition goals. If the facility produces less than 5 MW, projects can receive a 10 percent increase in value for siting projects in disadvantaged communities, or 20 percent total if in qualified affordable residential housing. Projects can also receive an additional 10 percent ITC (or a 10 percent increase in equivalent PTC) by using a certain percentage of domestically produced steel, iron, or manufactured products. Taking advantage of these incentives in combination means that a qualified clean energy project could receive up to a 50–70 percent tax credit. This structuring can help to ensure

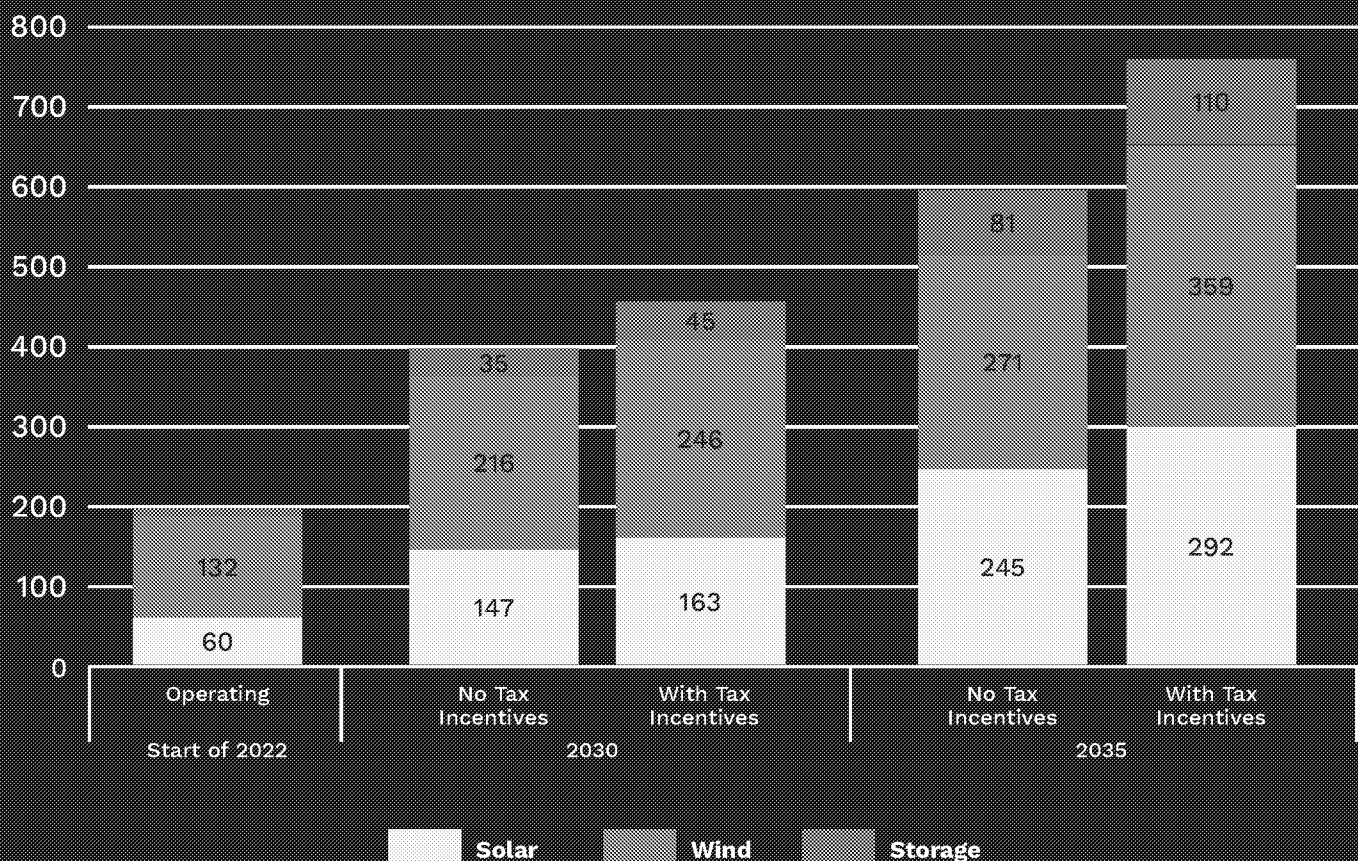
well-paying domestic jobs and equitable access to clean energy resources. Each of these adders and bonus credits are essential in targeting investment to the communities that have experienced the most economic pain from the transition to clean energy, as well as those that have suffered the most from disproportionate fossil fuel pollution.

The IRA also expands which utilities can use the tax incentives, with direct payments in lieu of tax credits available to municipal and cooperative utilities, Tribes, and nonprofits. Direct pay substantially widens access to these incentives by allowing organizations without tax liability to take advantage of them. Another key aspect is the law's transferability provision for companies that do pay taxes (and are therefore not eligible for direct pay). Through transferability, project owners can sell their credits to another party for cash,

allowing more companies to access the full benefits of credits regardless of federal tax liability. Transferability prevents an artificial ceiling on the volume of projects that can use the credits and avoids a big haircut (~25 percent of the value) going to Wall Street, unnecessarily. IRA tax incentives are more flexible and accessible, which will allow for the fastest renewables build-out in the U.S. to date.

NRDC's modeling projects that the tax credits could support 280 GW of new clean and low carbon resources by 2030, growing to over 580 GW of new clean and low-carbon capacity by 2035. This would be more than a doubling of U.S. renewable and battery storage capacity between now and the end of this decade, with almost a quadrupling of capacity by 2035. (Figure 4).

### Capacity Growth of Clean Electricity With and Without IRA Tax Credits

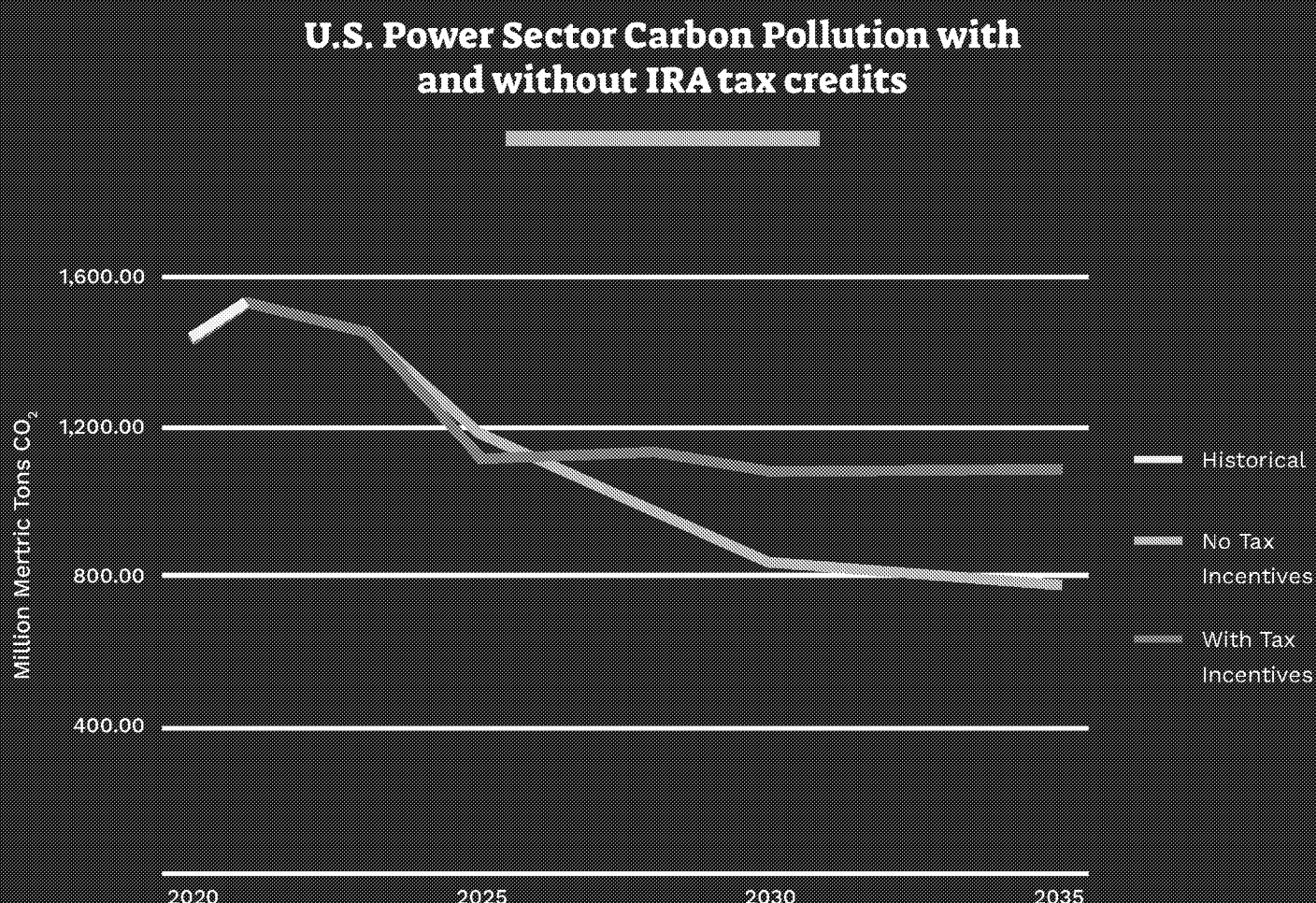


**Figure 4:** Capacity growth of clean electricity capacity in the years 2022, 2030, and 2035—with and without the IRA's clean energy tax credits.

NRDC's modeling finds that the clean electricity tax credits could cut about 250 million metric tons of CO<sub>2</sub> from the power sector in 2030 as compared to without the tax credits (Figure 5). This is equal to the carbon pollution from every power plant in Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia in 2021. **By 2030, carbon pollution from the power sector is projected to fall to 66 percent below 2005 levels due to the**

**IRA's tax credits.** Over the next 15 years, these tax credits are projected to cut around 2.6 billion metric tons of CO<sub>2</sub> pollution compared to a case without these tax credits.

This cleaner, low-carbon grid will reduce power prices by decreasing U.S. reliance on fossil fuels and their historically volatile prices. According to NRDC modeling, the tax credits are projected to cut the average residential bill



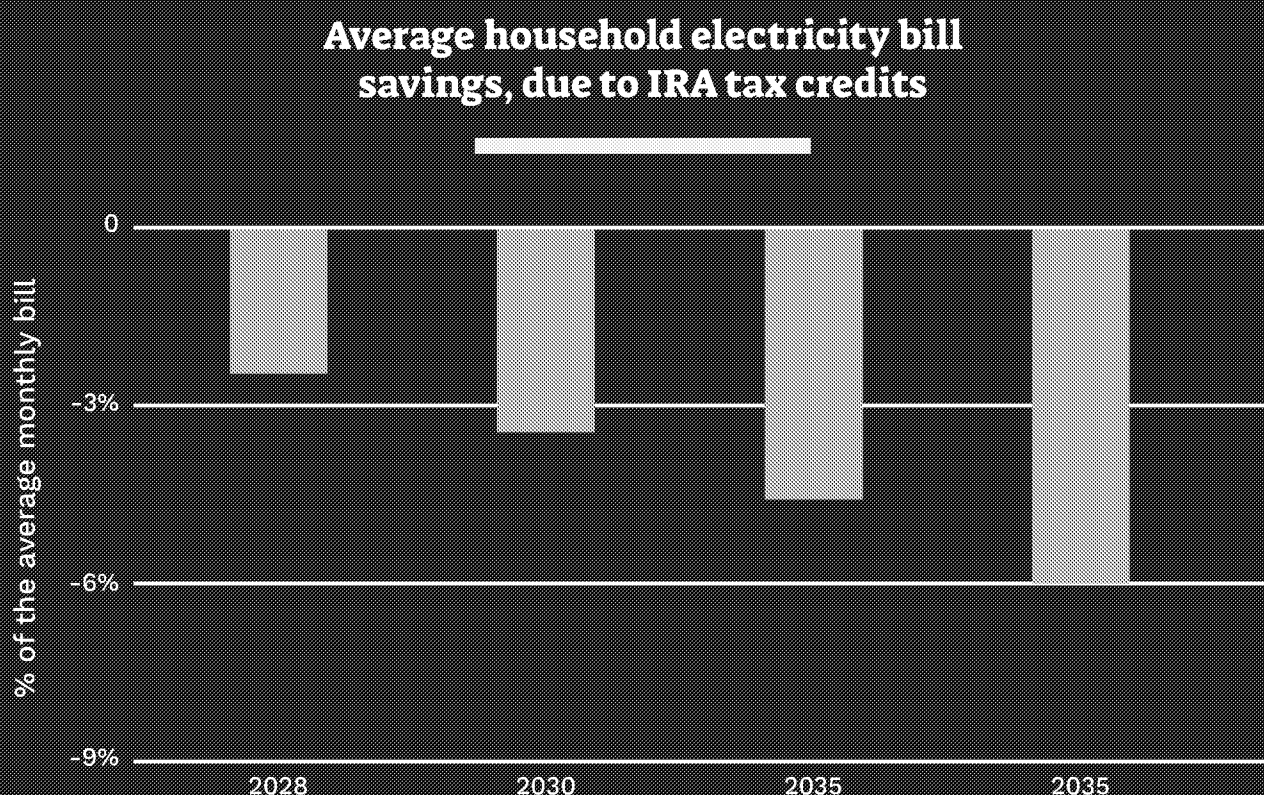
**Figure 5:** U.S. power sector carbon pollution before and after passage of the IRA's clean energy tax credits, through 2035 (assuming pre-IRA policies otherwise remain constant).

by 3.4 percent in 2030 and 4.6 percent in 2035, relative to a scenario without these credits (Figure 6). These savings have been found to be progressive, with low-income households seeing much larger relative benefits. In total, U.S. households are expected to see \$60 billion in electricity bill savings over the next 15 years. Saving consumers money makes it even more imperative to get to 80 percent by 2030 on the way to 100 percent clean power.

The IRA's tax credits will also reduce exposure to health-harming air pollutants. The annual national health benefits from power sector-related reductions in nitrogen oxides (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>) stemming from the tax credits amount to \$8.6–\$9.0 billion by 2030, growing to \$9.5–\$10.1 billion annually by 2035. These figures represent the monetized

benefits of avoided health issues, including avoided premature deaths, fewer ER visits and hospital admissions, fewer lost workdays and school days, and reduced childhood asthma attacks.

At the same time, the clean energy tax credits significantly increase and accelerate efforts by the federal government to catalyze development, commercialization and deployment of clean energy technologies to address climate change. Because of these numerous innovations, the Treasury Department must continue to issue guidance in a timely manner—and do it well. To that end, the department should work closely with DOE, the White House and OMB, and others who have experience and perspective on the full intent of the clean energy tax incentives.



**Figure 6:** Average household electricity bill savings due to the IRA clean energy tax credits through 2040, relative to no tax credits.

## 2. DOE Loan Guarantee Program

The IRA includes \$8.6 billion for DOE loan guarantees, enabling \$290 billion in loan guarantee authority. The DOE Loan Guarantee Program, which sits within DOE's Loan Programs Office (LPO), is a powerful tool for leveraging major private sector investment in clean and innovative energy technologies, especially for grid decarbonization. These investments include \$5 billion for a new Energy Infrastructure Reinvestment Program, enabling up to \$250 billion in loan guarantee authority, to retool, repower, repurpose, or replace retired energy infrastructure (like coal power plants), or build new clean energy infrastructure.

Because of the substantial capital utilities invested in the construction of fossil fuel power plants and unpaid debt on those projects, utilities often want to hold onto their existing fossil facilities. Loans and loan guarantees can help utilities refinance this debt, retire old facilities, and put the savings into new clean energy infrastructure. With large amounts of new loan guarantee authority, DOE must quickly ramp up its operations and staffing to get loans out the door in a timely manner. The \$250 billion to retool, repower, repurpose, or replace fossil fuel infrastructure, for example, must be spent by 2026. There is no time to waste.

The IRA also included \$3.6 billion for clean energy loan guarantees, which enables another \$40 billion in loan guarantee authority. Loan guarantees (and public finance instruments writ large) are powerful tools that can catalyze private investment far beyond the level of funding appropriated by Congress. Not every clean energy investment will turn into the next Tesla, but this is by design. If these investments held no risk, companies would not need a loan guarantee in the first place.

The Loan Guarantee Program is intended to grow and de-risk new technologies and business models that are unable to obtain sufficient financing from the private sector.

Furthermore, the IIJA, and the Energy Act of 2020 also made important reforms to the Loan Guarantee Program to facilitate greater access to this powerful federal finance program. One particularly notable reform in the IIJA clarified that state clean energy financing institutions (like "Green Banks") are eligible to receive financial support from the program. Another has allowed the DOE to waive the requirement that an eligible project feature "innovative technology," if it receives such a request from a state government and if the state is also providing said project with financial support. These reforms, plus new funding and financing authority for LPO, will allow DOE to support more states in deploying more clean energy projects. In turn, this will help advance and accelerate states' agendas for 100 percent clean electricity and building out domestic clean energy manufacturing capacity.

## 3. USDA Rural Utilities Financing

The IRA provides \$12.8 billion to help rural communities deploy more clean energy, including \$9.7 billion for U.S. Department of Agriculture (USDA) loans to rural electric cooperatives to obtain renewables and other carbon-free energy. These funds could be used to help rural co-ops retire their large coal fleets. Through the USDA Rural Energy for America Program, a further \$3 billion is available for rural energy loans and grants for renewable energy, including up to \$1 billion for all electric service providers, whether cooperative, municipal, investor-owned, or Tribal.

Rural co-ops still heavily rely on coal power, which is among the most polluting and expensive energy sources available. While investor-owned utilities have increasingly moved to cleaner and cheaper sources of energy, co-ops are often locked into long-term contracts and financial obligations with coal-fired power generation—and many co-ops that want to make the transition lack the financial flexibility to do so. The USDA Rural Utilities Service (RUS) should use its IRA funds to prioritize construction of clean energy projects that permanently replace coal generation on the grid. RUS should also fund planning and support for workforce transition for those displaced by these retirements.

This use of funding—replacing coal generation with clean energy—would have the highest impact in reducing carbon pollution, improving air quality and public health in rural communities, and lowering power costs for co-op owner-members. Any other use of funds, including for investments that prolong fossil generation, would not be in compliance with the IRA’s clear statutory mandate to maximize carbon pollution reductions—and would be a missed opportunity for the communities RUS was designed to serve. Since IRA’s clean energy tax credits offer direct pay to nonprofits, co-ops have a golden opportunity to retire polluting coal assets and transition to lower-cost clean energy.

#### **4. EPA “Force Multiplier” Programs Greenhouse Gas Reduction Fund, State Climate Pollution Reduction Grants, Environmental & Climate Justice Block Grants**

##### **Greenhouse Gas Reduction Fund**

The IRA provides \$27 billion towards the Greenhouse Gas Reduction Fund (GHGRF) administered by EPA (Sec. 60103). The

EPA Administrator is responsible for the distribution of funds, which will become available no later than Spring of 2023, and must be expended to funding recipients before the end of 2024. Through the GHGRF, EPA has the opportunity to support state and local clean energy leadership, and to build a robust nation-wide ecosystem of green and equitable finance—allowing people and communities to leverage public and private sector investments for climate solutions. The GHGRF can and should be a powerful force in building a cleaner, more resilient, affordable and equitable power sector.

The funding made available within the GHGRF is allocated into two programs:

##### **1. Zero-Emission Technologies Program:**

The zero-emission technologies section allows for \$7 billion in grants to be made available to States, municipalities, Tribal governments, and non-profit institutions, to provide grants, loans, and financial assistance to enable low-income and disadvantaged communities to deploy zero-emission technologies, including distributed solar. These funds should be prioritized for state, local and tribal programs that demonstrate a plan to deploy these investments equitably and effectively toward program goals.

**2. Clean Energy Accelerator:** The Accelerator provides approximately \$20 billion for grants to be made available to non-profit financing authorities to fund projects or efforts that reduce or avoid GHG pollution. This funding could be used to support state and local green banks and related clean energy finance institutions; one or more national green banks or green finance networks; a number of regional clean energy accelerators; and local community development institutions—or some combination of these and other

mission-aligned entities. In addition, the low-income and disadvantaged communities section ensures that at least \$8 billion, or 40 percent, supports low-income and disadvantaged communities, consistent with President Biden's Justice40 initiative.

The EPA and the public and non-profit entities eligible to apply for these grant funds will play a significant role in shaping the impacts of this program. EPA has a great deal of responsibility in choosing which projects will receive funding, including the authority to decide what carbon pollution-reducing projects will be deemed "appropriate" for funding. As we have seen with other actions this administration has prioritized, EPA should favor projects with the greatest potential to reduce GHG pollution, those that support high-quality union jobs, and projects that benefit low-income and disadvantaged communities.

In Fall 2022, NRDC, Evergreen and a number of other advocacy organizations wrote to EPA providing recommendations for implementation of the GHGRF. We urged the program to achieve three main goals:

1. Improve lives, especially for those in low-income and marginalized communities by reducing air pollution and planet-warming GHG emissions that threaten Americans' health, well-being, and livelihoods;
2. Catalyze far more than \$27 billion in GHG-reducing investments across the country, which will play a key role in modernizing the U.S. financial system by transforming 'green' investments into 'mainstream' investments and building a more equitable, clean energy future with significant benefits for underserved communities; and

3. Ensure that the \$20 billion green finance program and the \$7 billion for state, local, and Tribal governments to deploy zero-emission technologies in environmental justice communities share a common mission: to accelerate the transition to a clean, equitable economy, using distinct but complementary forms of financial and technical assistance.

## **State Climate Pollution Reduction Grants**

The Climate Pollution Reduction Grants program, also called the "State Climate Grants" program, consists of \$5 billion for states, air pollution control agencies, municipalities, and Tribal nations to develop and implement plans to reduce GHG pollution. This is an important program that EPA and the Biden Administration can use to support the next generation of state climate leadership—and state leadership on 100 percent clean energy, in particular.

This program is largely based on the State Clean Energy Challenge Grants first proposed in President Biden's [American Jobs Plan](#). It consists of three elements: 1) State Climate Planning Grants: \$250 million, which must be spread to at least one entity in each state; 2) State Climate Implementation Grants: \$4.607-\$4.75 billion; and 3) State Climate Administrative Funding: \$142.5 million (3 percent of Implementation Grants). While EPA grants can cover all sectors of the economy, states can and should look to use these grants to lock in faster policy change towards power sector decarbonization.

In December 2022, Evergreen, NRDC and 40 organizations wrote to EPA providing recommendations for implementation of the State Climate Grants program, including that EPA should:

- Quickly distribute Planning Grant funding

to states and Tribal nations, via formula, and should reserve a significant majority of Implementation Grant funding for a select few applications that demonstrate the most significant, additional climate pollution reductions.

- Prioritize most Implementation Grant funding for applicants that achieve statewide impact, in a single sector of the economy (e.g. towards 100 percent clean electricity), or in an economy-wide or multi-state plan, since states have wide jurisdiction over the major sources of climate pollution and economic development.
- Prioritize Implementation Grant funding for state applications that demonstrate a sort of ‘policy additionality’—i.e. show how federal funding will fill gaps, and unlock greater ambition than its current policy environment may otherwise allow.
- Encourage applicants to show how they’ll engage partners, support good jobs, and deliver the greatest pollution reductions and economic benefits for disadvantaged communities, consistent with Justice40.

- Move quickly to disburse State Climate Planning Grants in early 2023, ensure the State Climate Implementation Grants are all fully awarded in early 2024, and use administrative funding to expand regional federal capacity, so that state, Tribal and local governments have on-the-ground federal partners in driving the clean energy transition.

## **Environmental and Climate Justice Block Grants**

The IRA funds \$3 billion of Environmental and Climate Justice Block Grants for community-led projects to improve local environmental and public health in frontline and disadvantaged communities and to build community capacity to address disproportionate pollution and climate impacts. Grant projects could cover a range of activities, including pollution monitoring and prevention, climate resilience investments, mitigating health risks from climate-related events like heat waves and wildfires, increasing community engagement





in public processes like rulemakings, and other small projects—including that advance clean, renewable energy.

These funds are intended to go directly to disadvantaged communities for programs proposed and led by communities themselves, and EPA should prioritize applications accordingly. Funds for technical assistance can help build capacity in disadvantaged communities and assist organizations in applying for other grant opportunities. In Fall 2022, EPA took its first steps in implementation of the program, indicating, in a [presentation](#) to the National Environmental Justice Advisory Council (NEJAC) that it was likely to award funding to one entity in each EPA region that would act as a partner in disbursing the grant funds to community-based organizations.

The Environmental and Climate Justice Block Grants program is one of the IRA's most critically-important tools for advancing environmental justice, and equitable economic opportunity. It has the potential to support communities in building and realizing their own clean energy future, for themselves. One of the greatest opportunities for many disadvantaged communities could be in using these resources to help shut down polluting power plants and building locally-developed and owned renewable energy and energy storage projects, instead.

## 5. DOE Transmission Programs

### IRA Grants to Facilitate the Siting of Interstate Electricity Transmission Lines

The IRA includes around [\\$3 billion](#) for transmission infrastructure. That includes \$2 billion for transmission loans at DOE, \$760 million in grants to facilitate transmission

siting, and \$100 million for interregional and offshore transmission planning. The bill also allocates \$375 million to hire personnel at DOE, FERC, and the Department of Interior to process environmental permitting applications, which can help to facilitate transmission development across the U.S.

The \$760 million grant program is intended for state, local or Tribal transmission siting authorities to support accelerated siting of interstate electricity transmission lines. The Secretary of Energy is responsible for distribution of these grants by September 30, 2029, with use no later than two years after receipt. One of the biggest obstacles to deep decarbonization is America's aging grid. To upgrade and expand electric transmission at the necessary pace, states must coordinate at a regional level and build out projects on a tight timeframe. These funds present a critical opportunity to support these efforts through expedited interstate transmission siting. In the absence of a permitting reform bill in Congress, these funds can help speed up the permitting process for transmission projects.

### IIJA Transmission Investments and Programs

The IIJA also contains funding for grid upgrades and transmission. DOE has located many of these programs within its new Building a Better Grid Initiative.

#### *Convening stakeholders*

To implement the IIJA, DOE first planned a [series of convenings](#) to identify nationally significant transmission lines, validate transmission modeling approaches, and provide technical analysis on transmission. It also held a [series of workshops](#) on medium- and long-term offshore wind transmission challenges, and announced several transmission studies to identify new

or upgraded transmission facilities needed to deploy clean energy and integrate offshore wind.

### ***Boosting the grid***

DOE announced that it would begin to deploy the new financing authorities in the IIJA, including \$2.5B to facilitate the construction of high capacity new, replacement, or upgraded transmission lines, prioritized for projects that improve resilience and reliability of the grid, facilitate interregional transfer of electricity, lower electric sector greenhouse gas emissions, and use advanced technology. DOE will also provide \$3B to provide matching grants for the deployment of advanced grid technologies and a number of grants for transmission.

### ***Streamlining permitting***

DOE will work with other federal agencies to streamline federal permitting for transmission projects and may enter into public-private partnerships to develop transmission. To implement FERC's backstop transmission siting authority, DOE intends to provide a process for the designation of National Corridors on a route-specific, applicant-driven basis, emphasizing corridors that overlap with or utilize existing highway, rail, utility, and federal land rights-of-way. DOE said that it and FERC intend to work to establish coordinated procedures to implement these authorities. Using this federal siting authority is essential in streamlining transmission siting and planning, especially in light of Congress's inability to pass a permitting reform bill. Finally, DOE announced additional research, development, and demonstration efforts.



Quick Guide to IRA Clean Power Provisions		
Tax Components	Description	Timeframe
Renewable Energy Investment Tax Credit (ITC) Extension	Extends deadline to begin construction on projects by a year, and adds energy storage, certain biogas, and microgrid controllers to the list of qualified technologies under the credit *Geothermal projects have until 2035 to begin construction <ul style="list-style-type: none"> <li>Base Credit: 6%</li> </ul>	2023-2024*
Renewable Energy Production Tax Credit (PTC) Extension	Restores and extends PTC for solar, wind, and geothermal energy for projects that begin construction by Dec 31, 2024 <ul style="list-style-type: none"> <li>Base Credit: 0.3 cents/kilowatt hour</li> </ul>	2023-2024
Clean Energy Investment Credit (CEIC)	New production tax credit for any carbon neutral electric generation facility or substantially expanded EGUs <ul style="list-style-type: none"> <li>Base Credit: 6%</li> </ul>	2025-2032
Clean Energy Production Credit (CEPC)	New investment tax credit for any carbon neutral electric generation facility or substantially expanded EGUs <ul style="list-style-type: none"> <li>Base Credit: 0.3 cents/kilowatt hour</li> </ul>	2025-2032
Clean Energy Production Credit (CEPC)	New investment tax credit for any carbon neutral electric generation facility or substantially expanded EGUs <ul style="list-style-type: none"> <li>Base Credit: 0.3 cents/kilowatt hour</li> </ul>	2025-2032
Bonus Credits for The Above		
Labor Multiplier	5x multiplier to the base credit for projects that meet prevailing wage and apprenticeship standards	2022 & beyond
Domestically Produced Materials Bonus	10% increase in value of the tax credit for using domestically produced steel, iron, or manufactured product	2023 & beyond
Energy Communities Bonus	10% increase for locating the project in a brownfield site or formerly fossil fuel community	2023 & beyond
Disadvantaged & Low-Income Communities Bonus	For facilities under 5 MW taking an investment tax credit, 10% increase for siting projects in disadvantaged communities & 20% if in a qualified affordable housing project	2023 & beyond
Additional Tax Code Changes		
Direct Pay	Direct pay is unrestricted for the CCS credit, clean hydrogen PTC, advanced manufacturing PTC, and advanced energy project ITC. For all others credits, direct pay is restricted to tax-exempt and government entities.	2023 & beyond
Transferability	Taxpayers may complete a one-time transfer of tax credits to an unrelated taxpayer, and payments made to the original credit-holder in exchange for the credit are excluded from their income.	2023 & beyond
Grants & Funding Programs	Description	
GHG Reduction Fund	\$27B in funding with \$8B designated for zero emissions technology for low income and disadvantaged communities	
State Climate Pollution Reduction Grants	\$5B (4.75B for implementation, 0.25B for planning) to create and implement plans to reduce GHG pollution **Electricity Sector can be a part of this**	
Environmental & Climate Justice Block Grants	\$3B for environmental and public health projects in disadvantaged and frontline communities	
Grants to Facilitate the Siting of Interstate Electricity Transmission	\$760M to state, local or Tribal transmission siting authorities to support accelerated siting of interstate electricity transmission lines	
DOE Loan Guarantee Program	\$8.6 billion for DOE loan guarantees, enabling \$290 billion in loans to deploy clean energy and clean energy infrastructure and to retire fossil infrastructure	
USDA Rural Utilities Financing	\$12.8 billion in loans and grants to help rural electric cooperatives and other electric providers deploy more clean energy and retire fossil generation	
Powering Toward 100 Percent Clean Power by 2035		Table of Contents 35
ED_014173_00000008-00035		

## 2.4 Other Executive Branch Actions

### *Federal Utility Leadership*

The Tennessee Valley Authority (TVA) is a federally-owned utility providing electricity to about 10 million people across parts of seven southeastern states. It's also one of the largest emitters of air pollution in the country. TVA currently generates only 3 percent of its energy from wind and solar—far below the U.S. average of 13 percent. Worst of all, TVA is heavily invested in building new gas power plants, with 5 GW of new gas plants planned that would likely operate into the 2060s.

In the words of Senator Tom Carper, “TVA can and must do more, and it all starts with leadership.” The TVA is governed by a nine-person board of directors nominated by the President and confirmed by the Senate. In December 2022, the U.S. Senate unanimously confirmed six long-waiting Biden nominees to fill out the TVA board, narrowly avoiding a leadership crisis. These confirmations are a huge victory and should kickstart TVA's transformation from climate laggard to climate leader.

A full and functioning TVA board now can and should choose wind and solar over fossil gas, helping keep the U.S. on track to meet its 100 percent clean electricity by 2035 goal. Because the IRA made TVA eligible for direct payment of clean electricity tax credits, the opportunity for low-cost decarbonization is larger than ever. Using the IRA's substantial investments, TVA should become a clean energy powerhouse that leads the nation in clean energy deployment—and in the economic development that this investment can bring. This would be a remarkable

turnaround from its current situation, which includes plans to replace only 20 percent of its existing coal and gas generation with clean power.

### *Leasing of Public Lands and Waters*

Key agencies in the Department of the Interior, such as the Bureau of Land Management (BLM) and Bureau of Ocean Energy Management (BOEM), must swiftly and responsibly limit fossil fuel extraction and facilitate deployment of renewables on public lands and waters.

The Biden administration has already taken meaningful action to accelerate offshore and onshore renewable development. Over the last two years, federal agencies jointly announced a goal to deploy 30 GW of offshore wind energy by 2030, approved the first large-scale offshore wind projects, held a record-breaking lease auction in the New York Bight, and partnered with 11 East Coast states to strengthen the domestic offshore wind supply chain. At the end of 2022, BOEM announced \$757 million in winning bids for five wind lease areas off the coast of California with the potential to power over 1.5 million homes.

Onshore, BLM raised royalty rates on new oil and gas leases sold for the first time in decades. Using new criteria to assess land for leasing—including Tribal consultation, broad community input, and GHG emissions—BLM also reduced eligible acreage in a recent sale by 80 percent.

These are important steps in the right direction, but to reach net-zero emissions by 2050 the United States needs to devote considerable land area to developing solar and wind projects—anywhere from 61 million to 272 million acres according to researchers at Princeton. We are a long way from that goal,

and the fact is that fossil fuel companies still have the upper hand when it comes to leasing public lands and waters. Over three-quarters of public lands (over 78 million acres) in the Western U.S. with valuable renewable energy resources are currently prioritized for oil and gas leasing—even though those lands often have low potential for fossil development.

Harmful provisions in the IRA will cause real damage to frontline and fenceline communities, and complicate renewable deployment. Specifically, the law mandates three offshore lease sales in Alaska and the Gulf of Mexico, and makes onshore and offshore renewable development contingent on oil and gas lease sales for the next 10 years. This will worsen air pollution and degrade the environment, disproportionately harming disadvantaged communities. The required lease sales are also inconsistent with President Biden’s commitment to zero new oil and gas leasing on public lands and waters. To limit the harm from fossil fuel handouts in the IRA, the Biden administration should minimize new onshore and offshore fossil fuel leasing and limit production from existing leases. Earthjustice has pushed the Department of Interior to set protective lease terms that condition these sales on protections for people, wildlife, and the climate. The administration should do everything in its power to limit the harm from fossil fuel leasing. Communities and advocates also play an important role in fighting back to stop these destructive projects in their tracks.

To flip the scales toward clean energy and move away from a fossil-fueled economy, Biden must implement durable reforms to prioritize renewable development. Agencies like BLM and BOEM should build efficiencies into federal renewable development permitting processes to grant rights-of-way to individual wind, solar, and geothermal projects as soon as possible.

Of course, accelerated deployment must not come at the expense of environmental protections and meaningful cooperation with communities, workers, project stakeholders. Responsible renewable energy projects must ensure affected communities receive a fair revenue share and minimize impacts to wildlife, ecosystems, and cultural sites. To date, the Biden administration and BOEM have prioritized the creation of good-paying union jobs and the creation of a domestic supply chain for offshore wind by including stipulations in leases that preference bidders who sign community benefit agreements and project labor agreements, or invest in supply chain development and workforce training. This effort is commendable and should be carried forward for future lease sales.

Unlike fossil projects that create toxic, unjust “sacrifice zones” across the country, responsible renewable energy projects on public lands and waters can simultaneously achieve environmental justice, climate, and conservation goals. The Biden administration has already taken steps to prioritize federal renewable development—now it must go further.

## ***The Power of Procurement***

The U.S. government is the world’s largest procurer of products and services, spending \$665 billion on contracts in FY2020. By using clean electricity to power federal buildings, government vehicle fleets, and public housing, and leveraging IRA funding and existing federal programs, the U.S. government could cut GHG pollution by up to 333 million metric tons by 2030, according to analysis by Rewiring America.

In December 2021, President Biden issued executive order 14057, which commits the government to powering federal facilities with 100 percent carbon pollution-free

electricity by 2030, with 50 percent of that electricity available 24/7. Now the White House must continue to leverage its immense demand-side power to negotiate carbon-free contracts with utilities, enter into power purchase agreements, and develop new onsite renewable generation.

Successful federal procurement requires close collaboration with energy policy officials across the country. Key agencies and offices at the fore of clean electricity procurement are the White House Council on Environmental Quality (CEQ), home to the 24/7 carbon-free electricity working group; the Office of Federal Procurement Policy in the Office of Management & Budget; the Department of Defense; and the General Services Administration (GSA), the nation's landlord. These offices must collaborate to advance state, regional and federal clean power progress, with the aid of \$73 billion in the IIJA for the electric grid and power projects.

CEQ should work with GSA to require transparency and disclosure around climate and labor standards from government vendors, including reporting of scope 1, 2, and 3 emissions and net-zero commitments in line with the federal government's targets. GSA should make widespread use of energy savings performance contracts that require bidders to commit to electrification, efficiency, and emissions reductions, and to do so under project labor agreements. As the country's largest landlord and vehicle operator, overseeing more than 300,000 civilian buildings and 600,000 vehicles, GSA should deploy clean energy, distributed solar, and integrated grid technology in federal buildings, and fully electrify its vehicle fleet. The federal government has significant buying power, and the Biden administration shouldn't neglect this crucial demand-pull policy to drive power sector decarbonization, including for fledgling clean firm technologies that are essential to 24/7 carbon-free electricity for both the federal government and the wider grid.



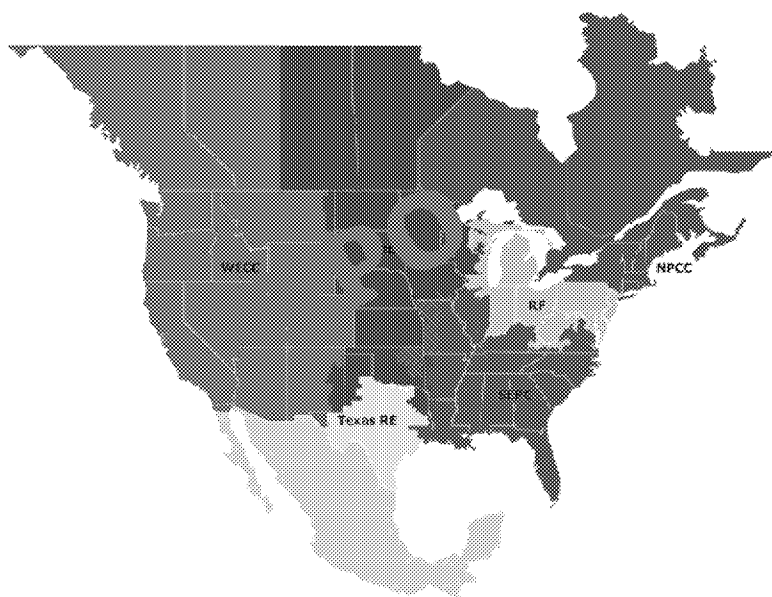
### 3. State Leadership: An Action Plan for State Lawmakers and Advocates

States have been instrumental in driving early progress toward our 100 percent clean electricity future. With the recent passage of the IRA, states and utilities can transition their energy mix faster—this raises the bar nationwide on climate ambition. State actions will also be crucial in closing the gaps between current policy and our national climate and clean power targets. In this section, we summarize the current state-level clean electricity landscape and provide several leverage points where governors, legislatures, utilities, utility regulators, and advocates can and should push further.

The climate and clean energy provisions in the IRA are modeled to reduce U.S. carbon pollution to around 40 percent below 2005 levels by 2030. However, much of the IRA's reductions, including through tax credits, require implementation in the states. For example, if states, utilities, and utility regulators keep their existing, pre-IRA

policies, clean energy standards, and utility integrated resource plans (IRPs) on the books, then we will fail to cut carbon pollution at the predicted pace, and many of the IRA's reductions will go unrealized. The IRA can be a paradigm shift toward clean energy—but only if state ambition increases accordingly. A recent report from Energy Innovation highlights the important roles that legislators, governors and state energy offices, and utility regulators each have in ensuring the full benefits of the IRA are realized in the states.

Whether through executive order, public utility commission (PUC) regulation, or legislation, states need to advance 100 percent clean electricity standards (CES), and complementary policies, with ambitious timelines and strong interim targets. At the same time, states and utilities should prepare to seize upon new funding programs created by the IRA that will accelerate the transition to the clean energy economy.



**Figure 7:** Map showing states that have set 100 percent clean electricity standards, with the year they have committed to achieving 100 percent clean power.



### 3.1 State 100 Percent Clean Electricity Standards

From the Pacific Northwest to the Southeast, from New England to the Midwest, the switch from fossil fuels to renewable, clean, and zero-emission electricity is happening everywhere. States across regions and party lines are rapidly mobilizing towards 100 percent clean energy.

As of September 2022, twenty-two states plus Guam, Puerto Rico and Washington, D.C., have set a goal to achieve 100 percent renewable or carbon-free electricity (Figure 7). However, not all of those targets are binding requirements for electric utilities under state law. Several aim for “carbon neutrality” as opposed to carbon-free electricity as an ultimate, rather than interim, target. Targets also vary in terms of timeframe and eligible resources, the definitions of which are not always synonymous. States should update their clean electricity goals with legally binding targets for 100 percent carbon-free power by 2035 and ambitious interim targets for this decade, such as 80 percent clean electricity by 2030.

The strongest 100 percent clean goals are bound in law on tight timeframes and include ambitious interim deadlines, capacity targets for specific renewable technologies, just transition and workforce training plans, public utility commitments, and a commitment to promote environmental justice.

For example, Hawai'i became the first state to pass a 100 percent clean energy standard in 2015. In 2019, New Mexico enacted the [Energy Transition Act](#), requiring 100 percent clean energy by 2045 with strong interim targets that ensure long-term goals will be paired with short-term action. In the same year, the

Colorado legislature (SB 236) required the state's largest utility to file a clean energy plan that would achieve at least 80 percent emissions reductions from 2005 levels by 2030, and in 2021 required other utilities to do the same (HB 21-1266). Washington state's [Clean Energy Transformation Act](#), also passed in 2019, requires utilities to achieve 80 percent clean (and 100 percent carbon-neutral) power in 2030, en route to fully 100 percent clean energy. The 2020 Virginia [Clean Economy Act \(VCEA\)](#) mandates a zero emissions power sector by 2050, with an even more aggressive timeline for Dominion Energy, which is currently responsible for the lion's share of power sector emissions in Virginia. The VCEA also includes a number of capacity targets for specific technologies, like solar and offshore wind, to encourage clean energy development at the lowest cost.

Another energy law was enacted in October 2021 in North Carolina, mandating a 70 percent statewide reduction in power sector carbon pollution from 2005 levels by 2030 and carbon neutrality for the sector by 2050. This should prevent any new fossil gas infrastructure from being built in the state, though there is still some uncertainty as to the exact timeline required by the law. Nevertheless, the legislation reflects bipartisan progress in the state.

Where state legislatures block passage of clean energy policy, states can take executive action and public utilities can set their own targets. Even in more conservative states, where just a few years ago clean power policies might have seemed far fetched, progress is accelerating through these routes. In late 2021, Nebraska became the first [mostly red state](#) to commit to a net-zero power sector by 2050 when its three largest utilities, each publicly owned, adopted clean power targets. Although the goal is nonbinding,



the democratically elected utility officials were able to deliver a decarbonization plan when previous efforts were blocked by the state's conservative legislature.

Just in 2022 alone, Rhode Island updated its renewable portfolio standard (RPS) to require 100 percent renewable electricity by 2033; Connecticut codified its carbon-free electricity goal into law with Senate Bill 10; Maryland enacted sweeping climate legislation with a 2045 net-zero goal; and North Carolina announced a 2050 economy-wide net-zero target by executive order. Now, with the passage of the IRA in August 2022, governors and state legislatures have a tremendous opportunity to utilize new funds and tax credits to greenlight major projects that will speed their way to meeting 100 percent clean energy goals.

However, while progress has been steady these last few years, a majority of states still don't have a 100 percent clean electricity goal. Now is the time for states to follow the example of their neighbors and set ambitious targets with robust performance standards and complementary policies. The four states with newly-elected Democratic trifectas (Michigan, Minnesota, Maryland, and Massachusetts) have an excellent opportunity to pass a binding 100 percent CES through the legislature, or to speed up the timeline of existing CES policies. Where legislative action proves difficult to reach, states can make meaningful progress via requirements and oversight through their public utility commissions, and robust implementation of new federal investments.



## 3.2 The Role of Public Utility Commissions and Utilities

Public utility commissions are the state agencies responsible for regulating monopoly utilities in each state. These entities will play a critical role driving progress towards 100 percent carbon-free power—and transformational new federal investments have totally changed the game for each of them.

Recent research shows that, despite having made public commitments to reduce emissions and address their climate impacts, many utility companies are failing to take necessary actions toward decarbonization. In fact, over multiple decades, some electric utility organizations promoted messaging designed to deny, delay, and cast doubt on the need for climate action. Many electric utilities do not have viable, near-term plans to retire existing coal generation, are planning to construct new gas-powered generation intended to run for decades, and are not adding new clean energy resources at the pace necessary to meet even their own, self-imposed goals.

There are signs of progress in the utility sector. Many utilities have made strong advances in reducing carbon emissions, NO<sub>x</sub>, SO<sub>x</sub> and other traditional pollutants.

To make faster progress toward federal, state, or even their own clean energy goals, all utilities can and should now take full advantage of the IRA's substantial incentives for clean power. Thanks to the IRA, municipal utilities, rural electric cooperatives, and the Tennessee Valley Authority now have access to direct payment of clean energy tax credits to develop their own wind, solar and storage. As discussed in section 2.3, the IRA also provides

DOE and USDA with substantial funding and financing authority to deploy low-cost clean energy loans to refinance and retire fossil fuel plants. In total, there's nearly \$15 billion solely dedicated for utilities of various types to retire fossil fuel power plants and invest in renewable energy generation.

Now that finances have changed to bring down the cost of clean energy for the next decade and beyond, PUCs should require their utilities to update all IRPs, or other long-term resource plans made before the IRA was enacted. IRPs have been a major driver of utility decarbonization to date, but failure to revisit IRPs based on pre-IRA cost assumptions would cost customers billions in higher electricity bills and potentially lock in new uneconomic gas plants, leading to higher carbon emissions for decades. With long-term tax credits, wind, solar, and storage are even cheaper than before—and they were already the lowest-cost resource in most parts of the country. A recent RMI study found that renewables that take full advantage of IRA tax credits will be cheaper to build than 99 percent of proposed fossil gas plants. Furthermore, expected electrification of transportation and buildings will increase the amount of flexible demand that can better align with the availability of renewable resources, representing a new opportunity for states and a challenge for IRPs.

Utilities and PUCs should finalize new IRPs with substantially faster expansion of clean energy, faster coal retirements, inclusion of demand flexibility and energy efficiency, and no new gas plants.

Regarding proposed fossil gas power plants, states should reinforce the “used and useful” ratemaking standard, ensuring that utilities can only recoup costs from ratepayers for new power generation facilities that are found to be prudent and remain economic and operating. Although markets have begun favoring clean energy sources like solar and wind, which keep prices low for end-use consumers, utilities are sometimes incentivized to inflate rates by investing in new uneconomic, polluting fossil gas generation. Unfortunately, the once widely enforced “used and useful” standard has been weakened or eliminated altogether across many states. State regulators must step in to protect consumers and align utility incentives with what the market and clean power targets require.

PUCs can take additional steps to require that utilities clean up their operations, in spite of incentives that might discourage decarbonization. First, PUCs and legislatures should increase (or create) energy efficiency resource standards in their states. These standards require utilities to meet a certain amount of demand each year from energy conservation. PUCs could also explore performance-based regulation or performance incentive mechanisms based on utilities meeting carbon targets, clean energy deployment goals, or energy efficiency performance standards. This would ensure that utility incentives are aligned with state decarbonization policies, instead of the other way around.

Even without performance-based rates that change utilities’ incentive structures, PUCs should work to enforce and strengthen utility goals and commitments wherever possible, including in their oversight of utility planning and investment decisions. To ensure just and reasonable rates, PUCs must ensure that utilities fairly and comprehensively evaluate clean resources. One option is to require

that utilities use all-source competitive procurements. When all resources are forced to compete on a level playing field, clean energy often wins. Post-IRA, the case is even more compelling.

### **3.3 State-level Efforts to Advance a Just Transition**

Prioritizing environmental and economic justice in state policy is critical to realizing a successful, equitable transition. States like Illinois, Washington, and New York have begun to address this, passing legislation that advances environmental justice and supports good union jobs, along with or as a follow-up to setting robust clean energy or GHG requirements. As a whole, states need to do more.

First and foremost, every state should implement policy that prioritizes clean energy investment in disadvantaged communities, similar to President Biden’s Justice40 Initiative directing at least 40 percent of climate and clean energy benefits toward disadvantaged communities. This Biden administration initiative was itself inspired by state action—borrowing from New York’s Climate Leadership & Community Protection Act that passed in 2019. Going forward, similar state policymaking processes should ensure that communities of color and low-income communities have power and agency in both the design of Justice40-like policy and in local investment decisions.

Like the federal Justice40 Initiative, state policies should take a wide-angle approach to public spending, including energy efficiency programs, clean energy investments, pollution reduction and electrification programs, household energy assistance,

public financing from green banks, and workforce development efforts. States can also create carve outs in CES policies that require utilities to prioritize benefits to disadvantaged communities. States could require that utilities target a certain percent of renewable energy investment into disadvantaged communities (like in Colorado), or require utilities purchase a certain amount of their electricity from community solar projects in disadvantaged communities (as in Massachusetts). Distributed generation and efficiency upgrades should happen first in public housing and other disadvantaged communities, where energy costs can average 13.9 percent of household income—sometimes as high as 30 percent.

States' clean energy agendas should also support good-paying union jobs, and a just transition for workers and communities that have been historically reliant on fossil fuel industries. Here, too, states have already demonstrated leadership. Washington state's 2019 Clean Energy Transformation Act included clean energy tax incentives tied to project developers meeting certain labor standards, such as paying prevailing wages, utilizing registered apprentices, and entering into Project-Labor or Community Benefits Agreements. Meanwhile, Colorado in 2019 created an Office of Just Transition to assist workers and communities adversely affected by the loss of jobs and revenues related to the coal industry. The IRA's tax credits reflect each of these progress points in state policy—providing larger tax incentives for projects that pay prevailing wages and utilize registered apprentices, and further bonus credits for clean energy and manufacturing projects located in traditionally fossil-reliant “energy communities.”

New federal funding can also further state, local and community efforts to advance

energy justice—making energy systems more affordable, accessible and equitable, in addition to cleaner and less-polluting. New federal tax credits include an expanded incentive for projects under 5 MW that specifically benefit low-income communities and affordable housing residents. Major new grant programs at the EPA, such as the Greenhouse Gas Reduction Fund, and Environmental & Climate Justice Block Grants program, can directly support energy justice through project funding, and should privilege states that focus on environmental justice into their policies and grant applications. State agencies prioritize applying for IRA funding that will spur a just clean energy transition. Additionally, states should follow the lead of State Reps. Gilda Cobb-Hunter (D-SC) and Larry Lambert (D-DE) in the creation of Justice40 oversight committees (like that which was first created in Delaware), or other environmental justice advisory councils (as in New York), to ensure that federal and state investments are truly benefitting disadvantaged communities and that those communities are represented in decision-making.

### **3.4 Taking Full Advantage of Federal Support for Clean Electricity**

To make the fastest progress toward 100 percent clean electricity, states should seize on new federal clean energy investments. The IRA provides numerous opportunities for states to accelerate their own plans to reduce GHG pollution and transition to a clean energy economy. However, states must be proactive and utilize the many resources that the IRA provides, including technical assistance, grants, loan programs and more.

As outlined in section 2.3, the IRA provides myriad important investments into power sector decarbonization. States lawmakers, regulators and advocates have the opportunity, now, to use those investments to accelerate the transition to 100 percent clean power. Specific IRA (and IIJA) programs that states should look to take advantage of include:

- **Clean Electricity Investment and Production Credits:** Federal clean energy tax credits that the IRA expanded and made more accessible and equitable over the coming decade, should redefine the speed and cost of the clean energy transition for utilities and their regulators, and other state policymakers.
- **DOE Loan Guarantee Program:** Massive new financing authority under this program is coupled with provisions making it particularly accessible for projects that benefit from state government support and co-investment .
- **USDA Rural Utilities Financing:** States and local government partners can work with their communities and public utilities to transition off of heavy-polluting power

plants and instead build job-creating clean energy projects.

- **EPA ‘Force Multiplier’ programs—Greenhouse Gas Reduction Fund, State Climate Grants, Environmental & Climate Justice Block Grants:** these programs provide a combined \$35 billion in investments that can be used by state, local, tribal and community-based organizations to leverage even greater private and public investment for a just transition towards 100 percent clean energy.
- **DOE Transmission Funding:** New funding, available through both IRA and IIJA, can support states, regional and utilities’ needs in the build-out of transmission infrastructure.

For a detailed breakdown of each of these state-focused provisions, including when and how much funding will be made available, refer back to section 2.3. States should note that some funding is only available until 2024 or 2026 and prioritize applying for those grants on a compressed timeline.



# 4. Conclusion

The clean energy transition is at an inflection point. Congress has taken enormous steps to move the needle on climate change by enacting historic investments in clean energy. While vital, these investments alone will not achieve U.S. climate targets. To achieve 100 percent clean power by 2035, the executive branch and states need to move swiftly on executive actions, IRA implementation, and state policy. Beyond climate, achieving President Biden’s ambitious clean air, water, and environmental justice goals will also require further action. Armed with new tax credits and federal funding, we are closer to these goals than ever before, but much of the fight is still ahead. EPA, FERC, DOE, utilities, and the states each have important roles in building a thriving, just and inclusive clean energy economy. It is now up to each of them—and to advocates across the country—to ensure that the grid transforms from 61 percent fossil-fueled, as it is today, to 100 percent clean. This paper has laid out the path ahead. Now we must start running.

Message

---

**From:** Denise Grab [dgrab@rmi.org]  
**Sent:** 5/24/2021 7:57:44 PM  
**To:** Goffman, Joseph [Goffman.Joseph@epa.gov]; Fine, Philip [Fine.Philip@epa.gov]; McGartland, Al [McGartland.Al@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Veney, Carla [Veney.Carla@epa.gov]; Newberg, Cindy [Newberg.Cindy@epa.gov]; Maranion, Bella [Maranion.Bella@epa.gov]; Shodeinde, Joshua [Shodeinde.Joshua@epa.gov]; Manliclic, Kersey [Manliclic.Kersey@epa.gov]; Snyder, Carolyn [Snyder.Carolyn@epa.gov]; Bailey, Ann [Bailey.Ann@epa.gov]; Noah Rothstein [noah@waxmanstrategies.com]; John Coequyt [jcoequyt@rmi.org]; Jim Dennison [jdennison@rmi.org]; rer8@nyu.edu; Senter, Stephen [Senter.Stephen@epa.gov]; Efron, Brent [Efron.Brent@epa.gov]; Moss, Jacob [Moss.Jacob@epa.gov]  
**Subject:** Re: Appliance Emissions Standard meeting with RMI  
**Attachments:** EPA's Role in Building Decarbonization.pdf

Hi all,

We look forward to our discussion shortly. We're hoping to screen share some slides (also attached). More information is also available in a fact sheet at [this link](#).

All best,  
Denise Grab



Denise Grab  
Manager RMI  
Carbon-Free Buildings Program  
Pronouns: she/her/hers

mobile +1 510.501.6380  
email [dgrab@rmi.org](mailto:dgrab@rmi.org)  
office 1901 Harrison St, Ste 200 | Oakland, CA | 94612  
twitter [@denisegrab](https://twitter.com/denisegrab)



Subscribe to RMI's new *Building Electrification* monthly newsletter for our latest insights and project developments



---

**From:** Goffman.Joseph@epa.gov  
**When:** 1:00 PM - 1:30 PM May 24, 2021  
**Subject:** Appliance Emissions Standard meeting with RMI  
**Location:** Microsoft Teams Meeting

Hi Delaney,

Thanks so much for coordinating. Here is the list of attendees:

- Rachel Golden (Sierra Club)
- Andres Restrepo (Sierra Club)
- Amneh Minkara (Sierra Club)
- Denise Grab (RMI)
- Jim Dennison (RMI)
- Talor Gruenwald (RMI)
- John Coequyt (RMI)
- Jack Lienke (NYU Law's Institute for Policy Integrity)

- Michael Goo (Waxman Strategies)
- Noah Rothstein (Waxman Strategies)
- Bruce Nilles (Climate Imperative)
- Rekha Rao (Climate Imperative)

---

## Microsoft Teams meeting

Join on your computer or mobile app

Ex. 6 Personal Privacy (PP)

Or call in (audio only)

Ex. 6 Personal Privacy (PP)

United States, Washington DC

Phone Conference ID

Ex. 6 Personal Privacy (PP)

Ex. 6 Personal Privacy (PP)

By participating in EPA hosted virtual meetings and events, you are consenting to abide by the agency's terms of use. In addition, you acknowledge that content you post may be collected and used in support of FOIA and eDiscovery activities.

Ex. 6 Personal Privacy (PP)

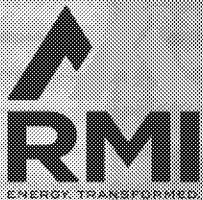
---





# **EPA's Vital Role in Reducing Air Pollution from America's Buildings**

**May 24, 2021**

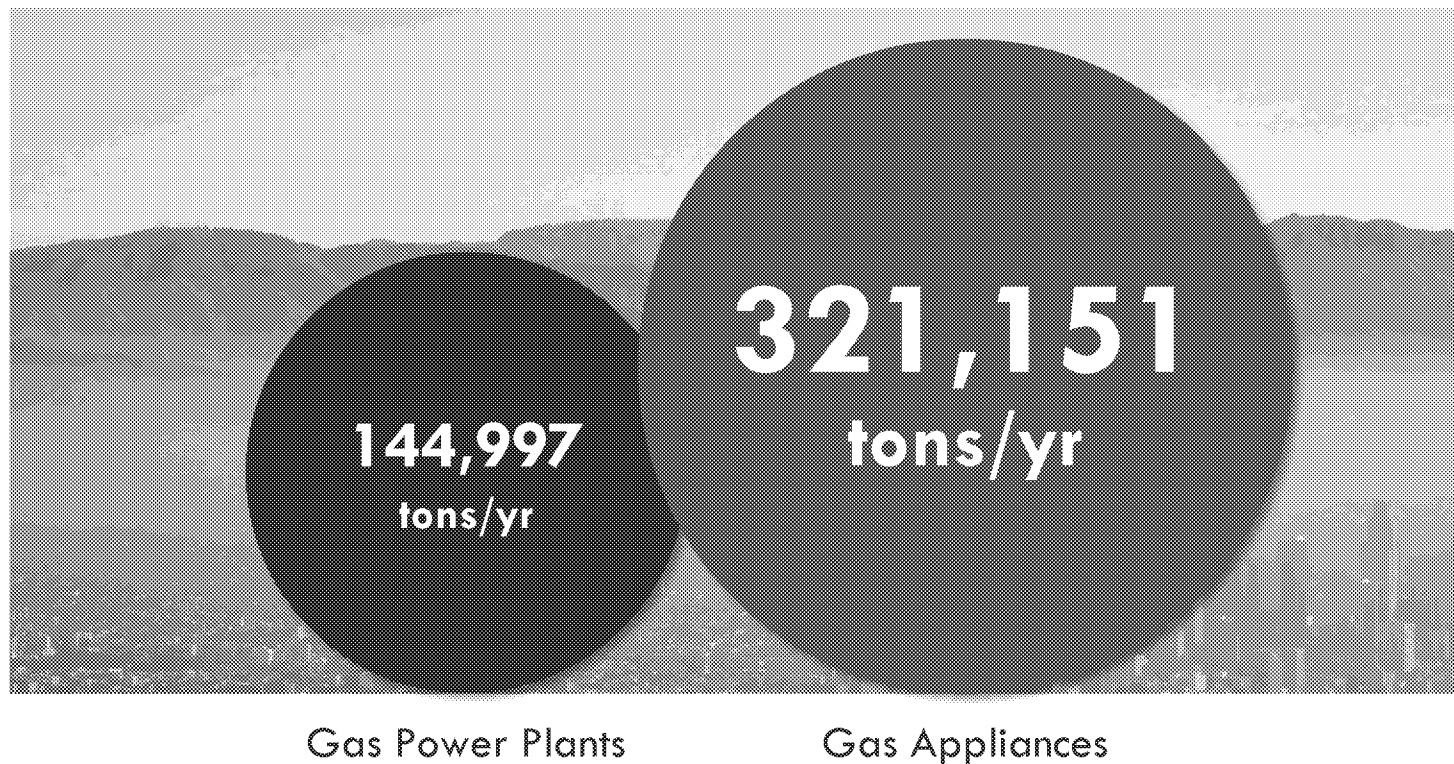


# AGENDA

- 1. Outdoor air pollution:** Appliances in buildings emit over 2X as much NO<sub>x</sub> as gas power plants, despite burning less gas
- 2. Indoor air pollution:** Gas stoves are a major risk factor for childhood asthma
- 3. Climate impacts:** 13% of US emissions from buildings; no plans to reduce
- 4. Regulatory pathways:** NSPS could save 4,000 lives, 500,000 tons NO<sub>x</sub>, 500 MMTCO<sub>2</sub>e per year

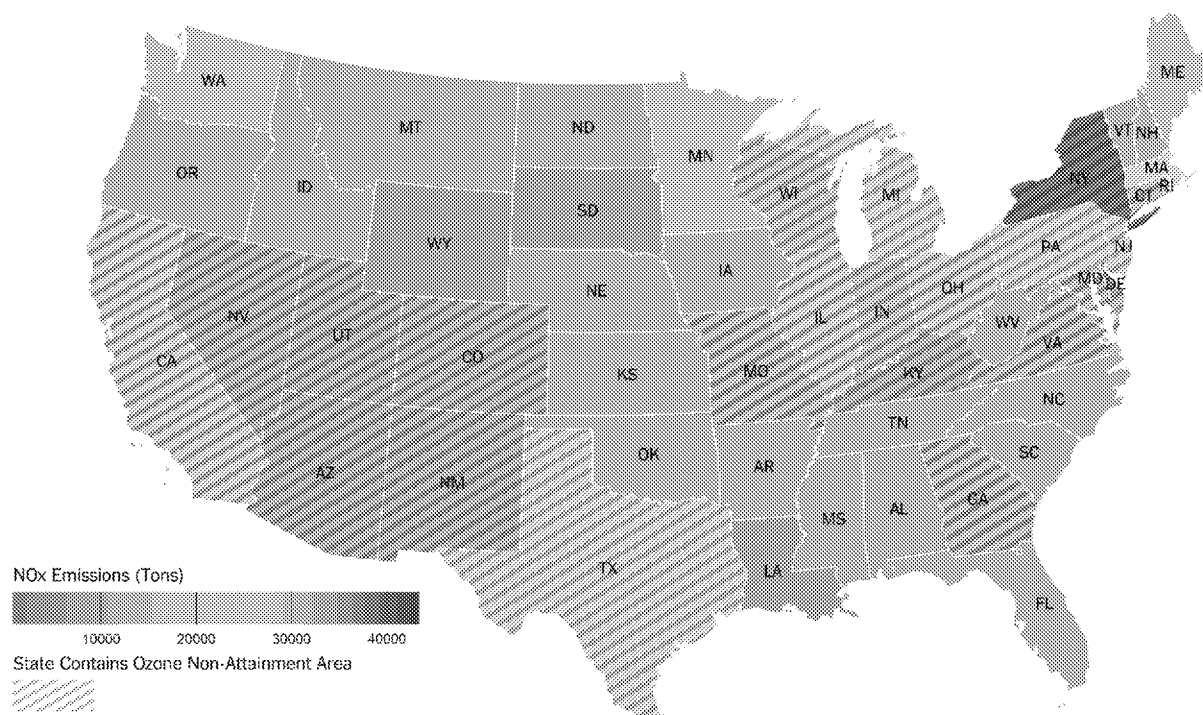


# Appliances emit over twice as much NOx pollution as gas power plants, despite burning less gas



# Building appliances contribute to nonattainment

NOx Emissions and Ozone Non-Attainment Areas



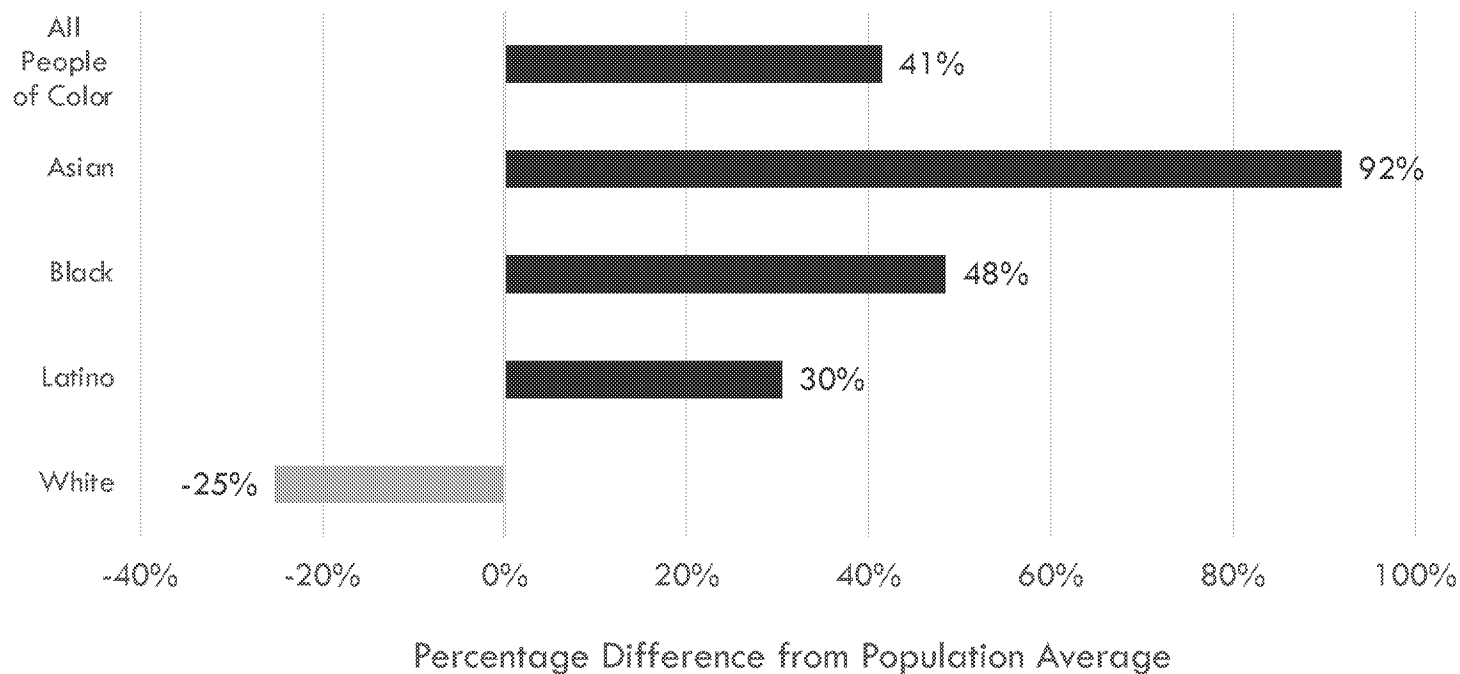
Note: Map depicts NOx emissions associated with natural gas, oil, and propane combustion in residential and commercial buildings



Source: EPA 2017 National Emissions Inventory and Green Book  
Nonattainment Areas

# Appliance pollution disproportionately harms People of Color

Disparity in Exposure to  $PM_{2.5}$  (primary and secondary)  
from Residential Gas Combustion

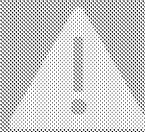


POCs' average exposure from residential gas appliances is 1.9 times that of Whites. Asian Americans' exposure is over 2.5 times that of Whites.



Source: Christopher W. Tessum et al., *PM<sub>2.5</sub> Polluters Disproportionately and Systematically Affect People of Color in the United States*, 7 Sci. Adv. eabf4491 (2021).

## Buildings Produce Hazardous Indoor Air Quality



→ Indoor pollutant levels may be **2 to 5** and as much as **100 times** higher indoors, where people spend **90% of their lives**.



→ Homes with gas stoves have **50 - 400%** higher NO<sub>2</sub> emissions than homes with electric stoves

→ A child living in a home with a gas stove has a **42% increased risk of asthma symptoms**.

# Why Building Decarbonization?

## A 1Gt Climate Opportunity Hiding in Plain Sight

**70**

Million US buildings burn fossil fuels

**13%**

Percent of GHG emissions from buildings

**1Gt**

annually

Of emissions from burning fossil fuels in buildings + gas methane leakage (CO<sub>2</sub>e)

**1.5°**

Requires eliminating 50% of fossil fuels in buildings by 2030



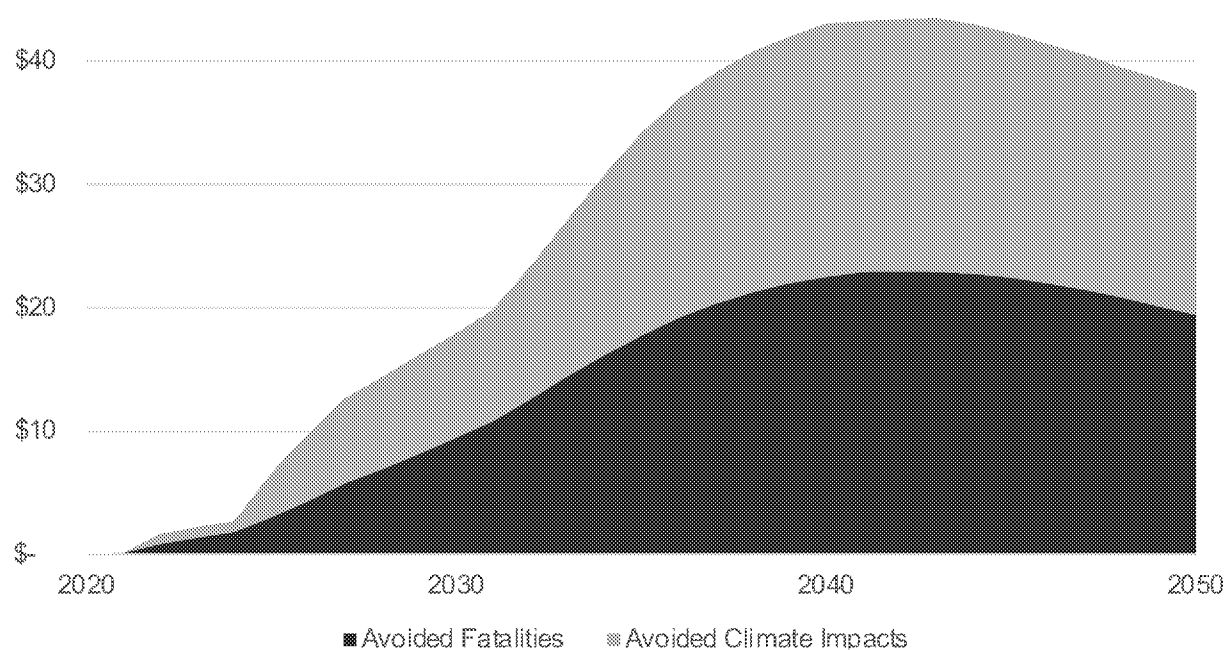
Source: Global Alliance for Buildings and Construction 2018; UN Environment Global Status Report; Buonocore et al. 2021

# All-electric new appliance sales by 2030 could save about 4,000 lives and over \$42 billion in health and climate costs per year by 2045

Annual Avoided Health and Climate Costs  
(Billion 2020\$)

Annual NO<sub>x</sub>  
reductions in 2045:  
530,000 tons

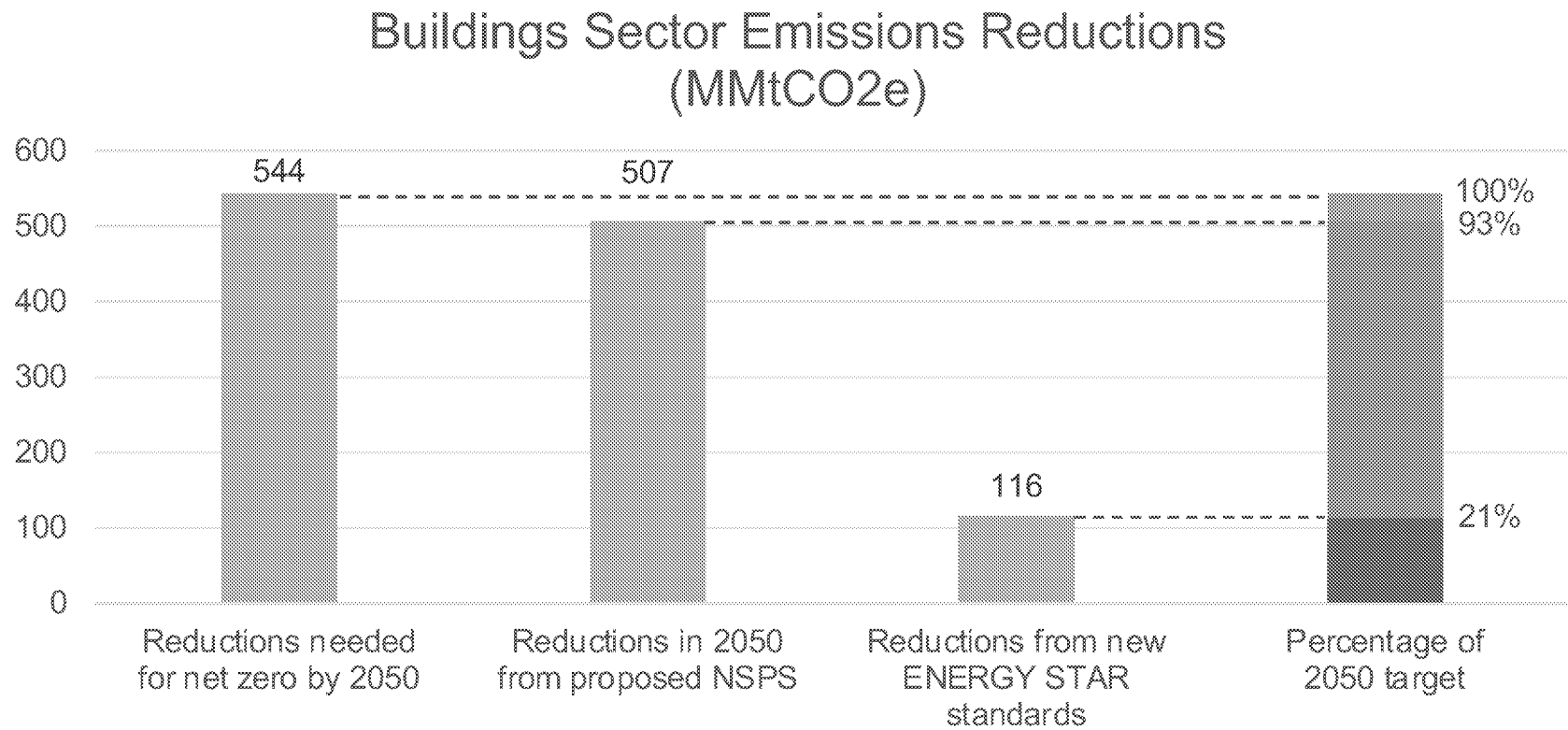
Annual GHG  
reductions in 2045:  
500 million  
metric tons CO<sub>2</sub>e



Sources: Energy Policy Simulator; Jonathan Buonocore et al., *A Decade of the U.S. Energy Mix Transitioning Away from Coal*, 16 Env'tl. Res. Ltrs. 054030 (2021); Interagency Working Group, *TSD: Social Cost of Carbon* (Feb. 2021); RMI Analysis

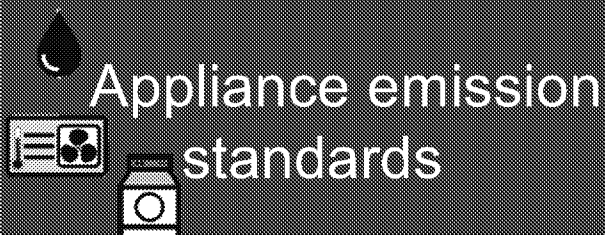


# Voluntary standards for heat pumps are not enough to meet climate goals; regulations are needed



Sources: Energy Innovation, *A 1.5°C NDC For Climate Leadership For The United States* (2021); RMI Analysis using Energy Policy Simulator; White House Fact Sheet: *Biden Administration Accelerates Efforts to Create Jobs Making Buildings More Affordable, Cleaner, and Resilient* (May 17, 2021)

# EPA can help align buildings with U.S. air quality & climate goals



Issue NO<sub>x</sub> and/or CO<sub>2</sub> New Source Performance Standards for furnaces, water heaters, and other appliances.



Indoor air quality & stoves

Organize a multi-agency taskforce to develop gas stove and ventilation guidelines that will protect every child's health.



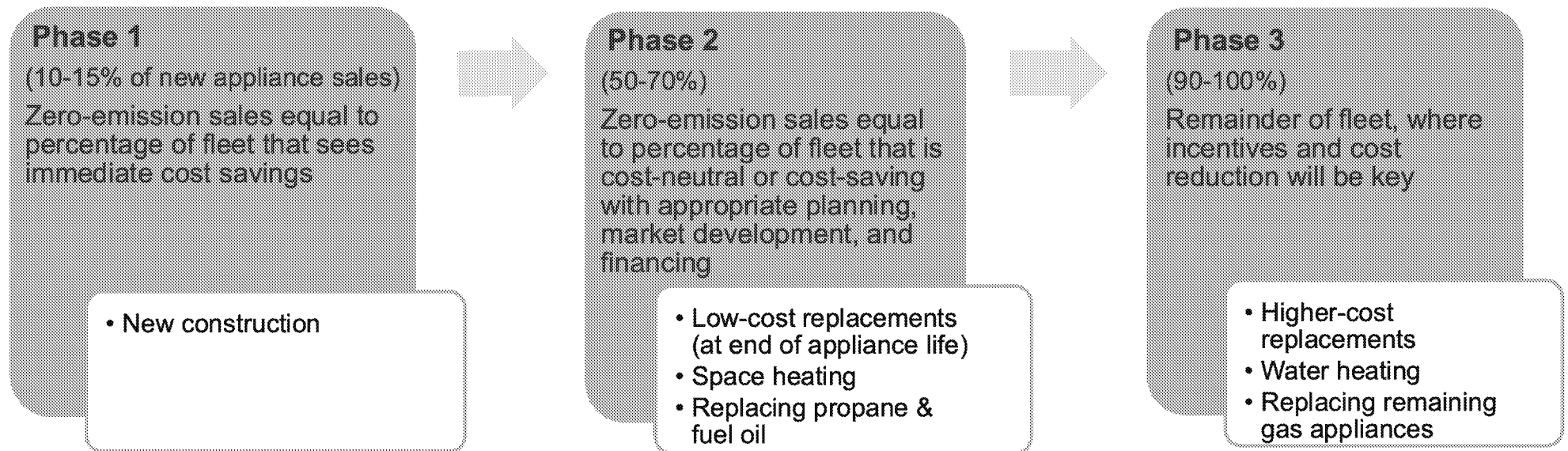
Interagency & state coordination

Work with states & agencies to establish **equitable, affordable** retrofit transition path. Ensure building emissions are addressed in SIPs.



# Performance standards for new appliances: potential approach

Fleet average zero-emission standards for new appliance manufacturers  
Phased in at a pace that aligns with health and climate goals



## Maximizing equity and affordability

EPA performance standards must phase in strategically and fit into a broader strategy to decarbonize affordably and equitably

Strategic  
Phase-In

Rebates &  
Incentives

Market  
Development

Rate Reform

Protections for  
LMI/Renters

Home  
Infrastructure  
Upgrades

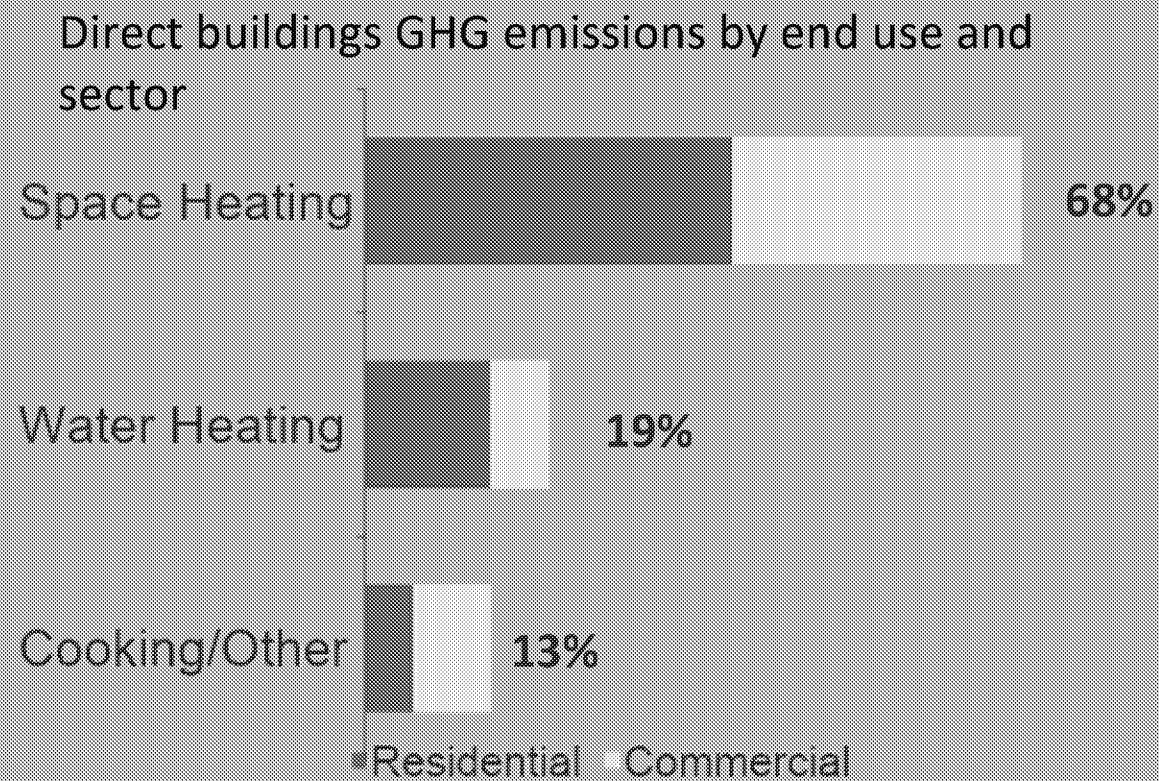
Gas System  
Planning



**Thank you!**  
**[rachel.golden@sierraclub.org](mailto:rachel.golden@sierraclub.org)**  
**[andres.restrepo@sierraclub.org](mailto:andres.restrepo@sierraclub.org)**  
**[dgrab@rmi.org](mailto:dgrab@rmi.org)**

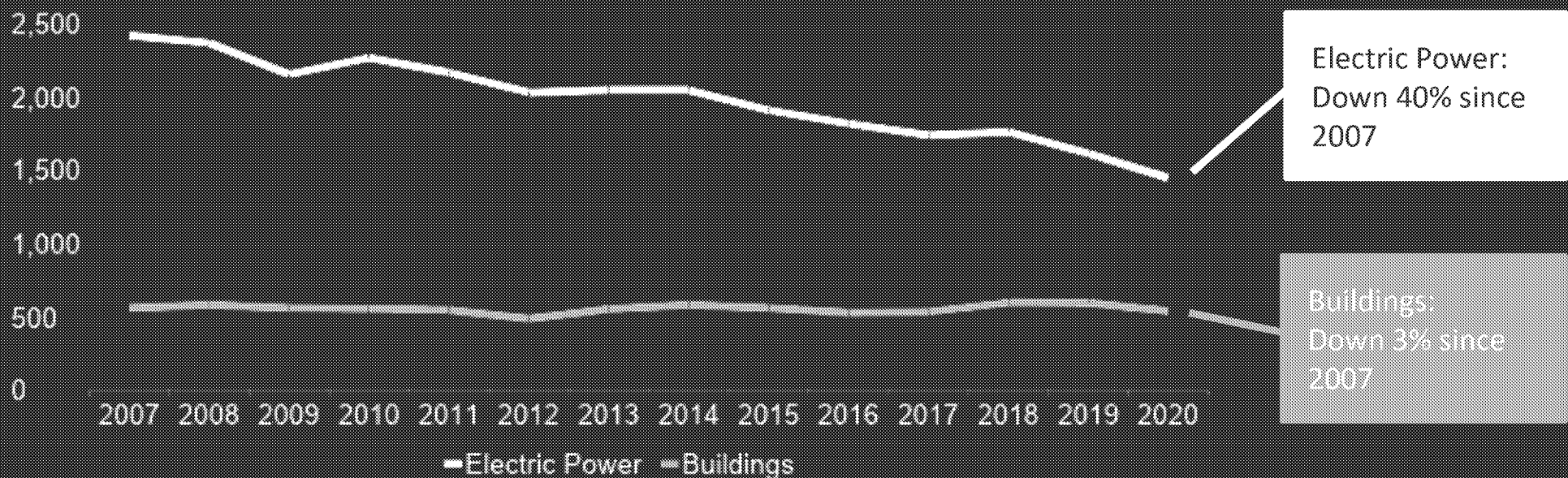
# Appendix

# 70 million US homes and businesses burn fossil fuels



# The United States has reduced carbon emissions from electricity, while the buildings sector is flat

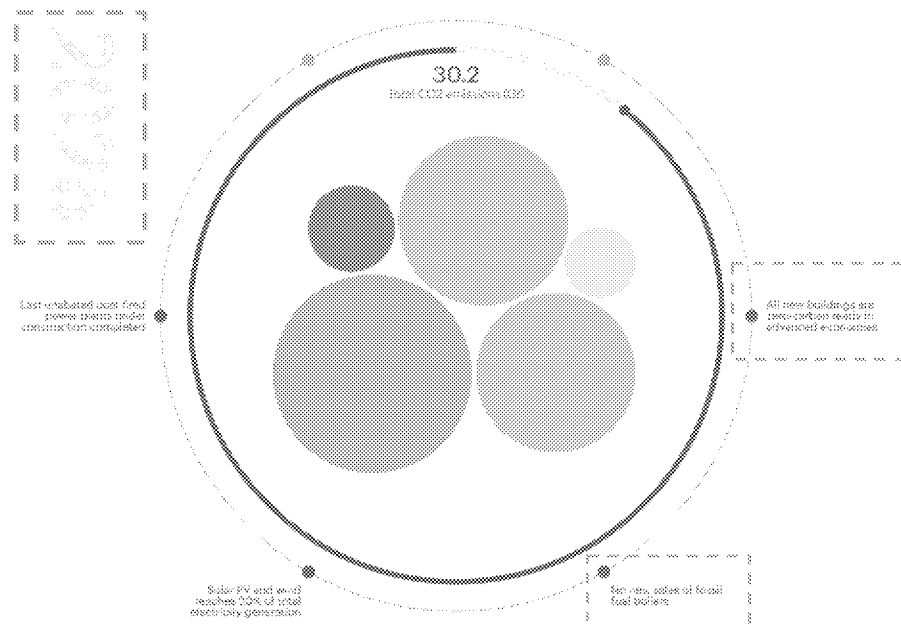
Annual CO<sub>2</sub> emissions from electric power and buildings sectors  
Million metric tons CO<sub>2</sub>, US total, 2007–2020



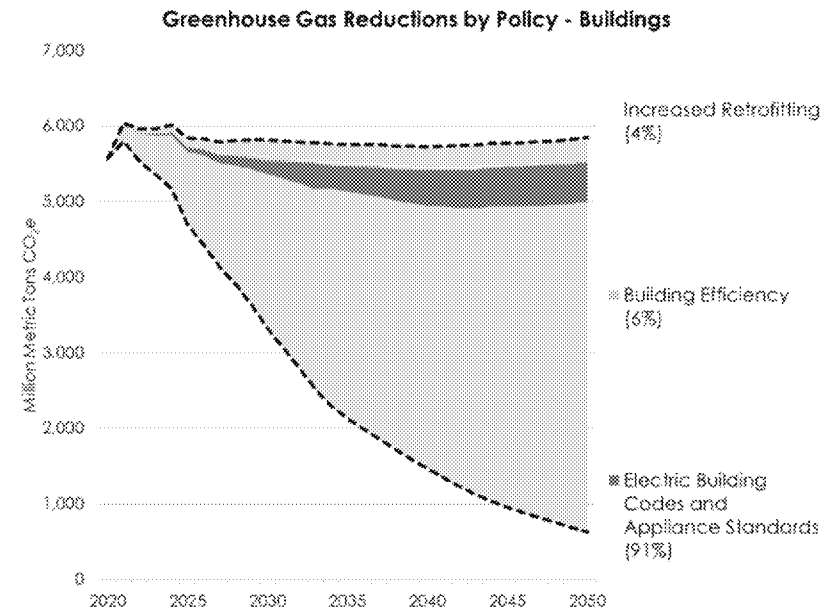
Source: EIA 2020



# Experts agree: the shift to zero-emitting appliances can't wait



**led**

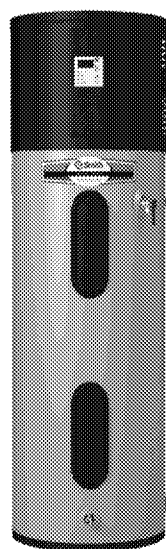


**ENERGY INNOVATION**  
POLICY & TECHNOLOGY LLC

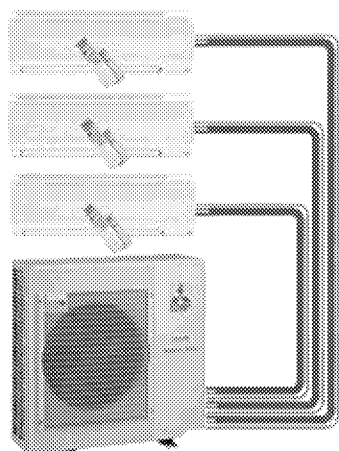


Source: Energy Innovation, *A 1.5°C NDC For Climate Leadership For The United States* (2021)

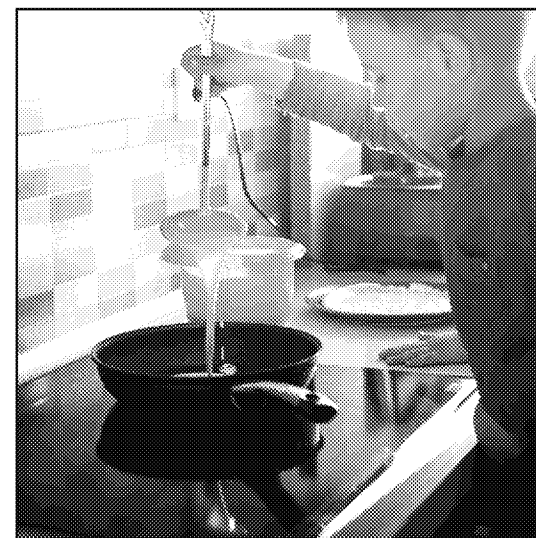
## Electric appliances are an efficient, widely available, zero-emitting control technology



Heat Pump  
Water Heater



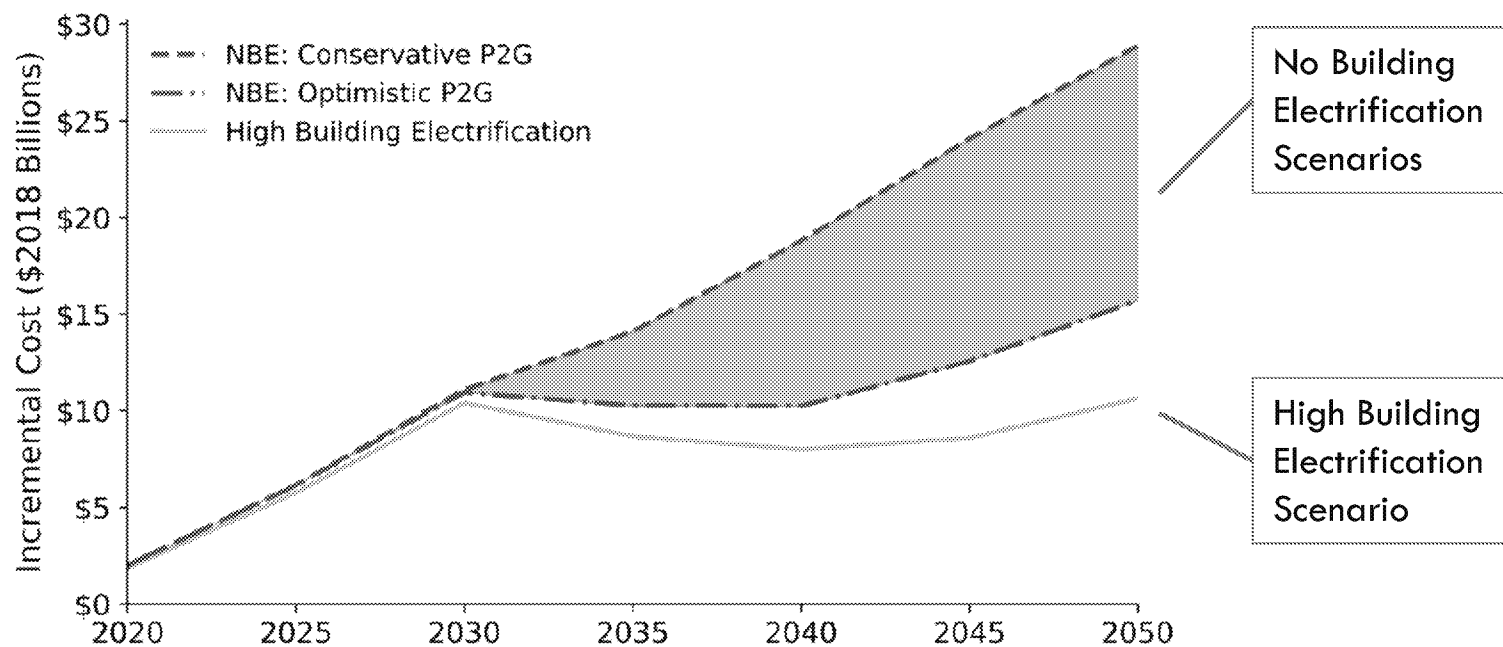
Heat Pumps for  
Heating and Cooling



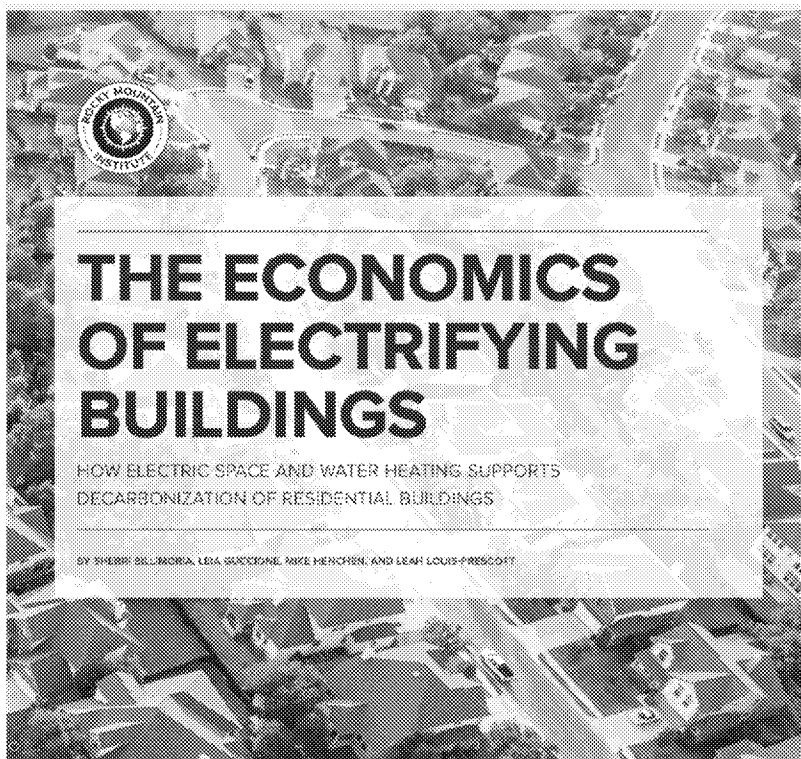
Induction Stove

# Zero-emitting appliances are the most cost-effective way to meet climate and health goals

**Figure 12: Economywide Annual Net Costs, Relative to Current Policy Reference Scenario**

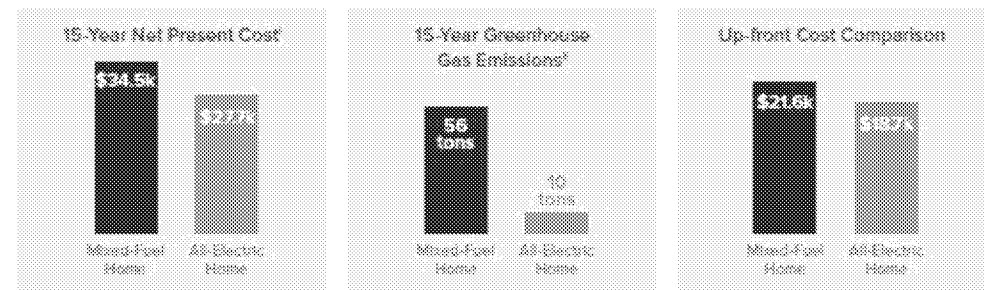


# All-electric new single-family homes are already cheaper across seven cities studied



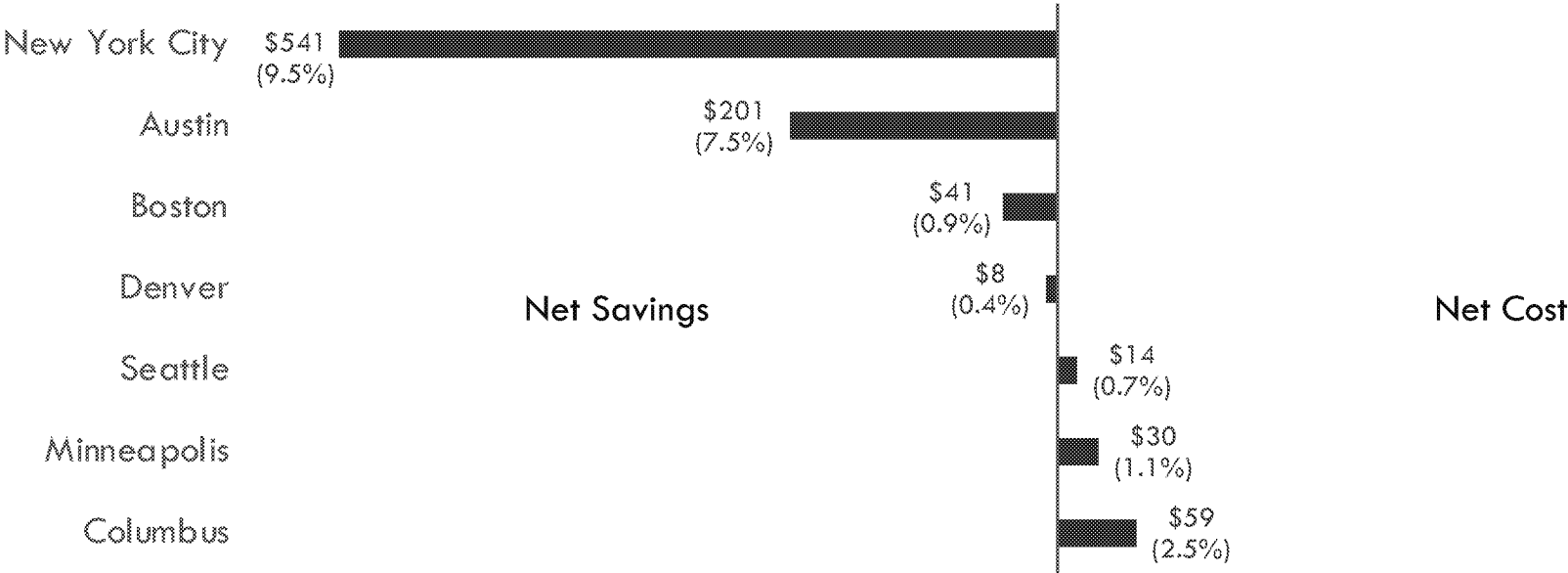
- Lower upfront costs and net present costs in all seven cities
- Operating costs were lower in three cities and comparable to gas appliances ( $\pm 3\%$ ) in the other four

RMI analyzed the costs of a new all-electric home versus a new mixed-fuel home that relies on gas for cooking, space heating, and water heating. In New York City, the all-electric home saves \$6,800 in net present costs and 46 tons of CO<sub>2</sub> emissions over a 15-year period.



# Electrification retrofits can reduce energy bills

Energy Bill Impacts of Electrifying Space Heating in Existing Single Family Homes  
(in \$ and as % of total annual bill)



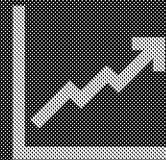
Source: RMI Analysis of an existing, 20-year-old, 2400 sf single family home, using local tariffs

# Cost-benefit analysis of performance standards should reflect the full range of zero-emission appliance benefits

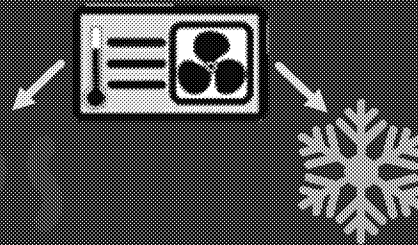
Health and  
climate benefits



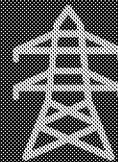
Less exposure to  
volatile gas prices



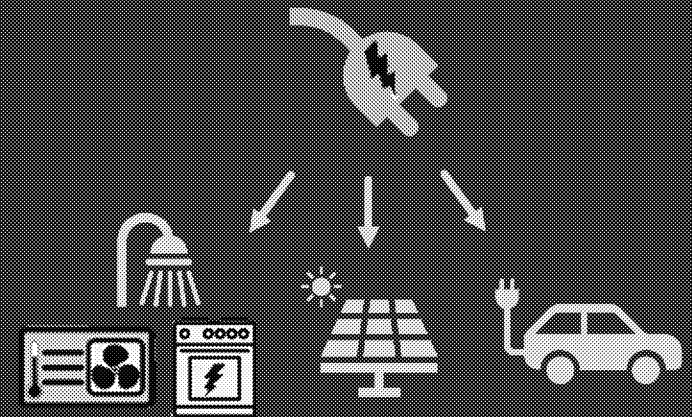
Heat pumps heat  
and cool homes



Grid management  
benefits



When needed, panel  
upgrades expand access to  
EV charging, solar & storage



## Appointment

---

**From:** Levy, Maxwell [Levy.Maxwell@epa.gov]  
**Sent:** 6/15/2021 6:17:50 PM  
**To:** Levy, Maxwell [Levy.Maxwell@epa.gov]; Enobakhare, Rosemary [Enobakhare.Rosemary@epa.gov]  
**CC:** ejcoalition.michigan@gmail.com; vmiller-travis@metgroup.com; Angelo Logan [alogan@oxy.edu]; Beverly Wright [beverlyw@dscej.org]; beverlywright@gmail.com; Hiltonkelley5011@gmail.com; pamela@akaction.org; Viola Waghiyi [Vi@akaction.org]; miya@apen4ej.org; LaTricea Adams [President@blackmillennials4flint.org]; glinson@caleja.org; CEJCoalition@gmail.com; newbian8 [newbian8@verizon.net]; nsheats@tesu.edu; blauderdale@earthlink.net; dmolina@cbecal.org; moniqueh@dscej.org; mroberts [mroberts@comingcleaninc.org]; DianeT@environmentalhealth.org; djwil51@gmail.com; ientomg@gmail.com; jose@just-transition.org; kwasserman@lvejo.org; jnwomack1@yahoo.com; tljslc@gmail.com; AliM@nwf.org; newalphacdc@gmail.com; Leownaconsulting@gmail.com; huy@opalpdx.org; poder.austin [poder.austin@gmail.com]; mychaljohnson@gmail.com; jinemexico@gmail.com; Ana.parras@yahoo.com; parras.juan@gmail.com; Harambee@gmail.com; swilson2 [swilson2@umd.edu]; elizabeth@uprose.org; kerene@weact.org; peggy@weact.org; Na'Taki Jelks [nojelks@wawa-online.org]; wera1usa@gmail.com; interfaith.earth@yahoo.com; drrobertbullard [drrobertbullard@gmail.com]; scharoldmitchell [scharoldmitchell@gmail.com]; kteglan@aol.com; kteglan51@gmail.com; Fine, Philip [Fine.Philip@epa.gov]; McMichael, Nate [McMichael.Nate@epa.gov]; Wieder, Jessica [Wieder.Jessica@epa.gov]; Cherepy, Andrea [Cherepy.Andrea@epa.gov]; Wood, Anna [Wood.Anna@epa.gov]; Ndoh, Tina [Ndoh.Tina@epa.gov]; Herbolsheimer, Courtney [herbolsheimer.courtney@epa.gov]; Kim, Eunjung [Kim.Eun@epa.gov]; Carbonell, Tomas [Carbonell.Tomas@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; caitlin.weact@gmail.com; Bhandari, Pradnya [Bhandari.Pradnya@epa.gov]; Jantz-Sell, Taylor [Jantz-Sell.Taylor@epa.gov]; Sasser, Erika [Sasser.Erika@epa.gov]; Wesson, Karen [Wesson.Karen@epa.gov]; Terry, Sara [Terry.Sara@epa.gov]; Efron, Brent [Efron.Brent@epa.gov]; lonnie.weact@gmail.com; taylor.weact@gmail.com; jose.bravo.jta@gmail.com

**Subject:** Environmental Justice Leaders Monthly Engagement Call  
**Location:** <https://www.zoom.us/j/914173000000> **Ex. 6 Personal Privacy (PP)**

**Start:** 6/16/2021 6:00:00 PM  
**End:** 6/16/2021 7:30:00 PM  
**Show Time As:** Busy

**Recurrence:** Monthly  
the third Wednesday of every 1 month(s) from 2:00 PM to 3:30 PM

**Required Attendees:** Levy, Maxwell; Enobakhare, Rosemary

**Optional Attendees:** ejcoalition.michigan@gmail.com; vmiller-travis@metgroup.com; alogan@oxy.edu; beverlyw@dscej.org; beverlywright@gmail.com; Hiltonkelley5011@gmail.com; pamela@akaction.org; Vi@akaction.org; miya@apen4ej.org; President@blackmillennials4flint.org; glinson@caleja.org; CEJCoalition@gmail.com; newbian8@verizon.net; nsheats@tesu.edu; blauderdale@earthlink.net; dmolina@cbecal.org; moniqueh@dscej.org; mroberts@comingcleaninc.org; DianeT@environmentalhealth.org; djwil51@gmail.com; ientomg@gmail.com; jose.bravo.jta@gmail.com; jose@just-transition.org; kwasserman@lvejo.org; jnwomack1@yahoo.com; tljslc@gmail.com; AliM@nwf.org; newalphacdc@gmail.com; Leownaconsulting@gmail.com; huy@opalpdx.org; poder.austin@gmail.com; mychaljohnson@gmail.com; jinemexico@gmail.com; Ana.parras@yahoo.com; parras.juan@gmail.com; Harambee@gmail.com; swilson2@umd.edu; elizabeth@uprose.org; kerene@weact.org; peggy@weact.org; Na'Taki Jelks; wera1usa@gmail.com; interfaith.earth@yahoo.com; drrobertbullard@gmail.com; scharoldmitchell@gmail.com; kteglan@aol.com; kteglan51@gmail.com; Fine, Philip; McMichael, Nate; Wieder, Jessica; Cherepy, Andrea; Wood, Anna; Tina Ndoh; Herbolsheimer, Courtney; Kim, Eunjung; Carbonell, Tomas; Nunez, Alejandra; caitlin.weact@gmail.com; Bhandari, Pradnya; Jantz-Sell, Taylor; Sasser, Erika; Wesson, Karen; Terry, Sara; Efron, Brent; lonnie.weact@gmail.com; taylor.weact@gmail.com

### June Monthly Environmental Justice Call

#### Topics:

- Purpose and goals of the monthly call
- EPA's 2022 – 2026 Strategic Plan
- Equity Taskforce Outreach

- Clean Air Act (CAA) List of Air Toxics Addition of 1-Bromopropane (1-BP) Engagement
- Public Listening Sessions on Upcoming Oil and Natural Gas Methane Rule
- Reconsidering the previous administration’s decision to retain the particulate matter (PM) National Ambient Air Quality Standards (NAAQS)
- ENERGY STAR Home Upgrade Program

*This monthly meeting with members of the environmental justice community is held for the purpose of exchanging information and gathering facts. EPA is not soliciting group or collective advice. Any advice provided to EPA during these meetings should be on behalf of yourself or the organization you represent, not the collective.*

Join ZoomGov Meeting

<https://> **Ex. 6 Personal Privacy (PP)**

Meeting ID: **Ex. 6 Personal Privacy (PP)**

One tap mobile

**Ex. 6 Personal Privacy (PP)** US (San Jose)  
US

Dial by your location

**Ex. 6 Personal Privacy (PP)** US (San Jose)  
US  
US (New York)  
US (San Jose)

Meeting ID: **Ex. 6 Personal Privacy (PP)**

Find your local number: <https://> **Ex. 6 Personal Privacy (PP)**

Join by SIP

**Ex. 6 Personal Privacy (PP)**@sip.zoomgov.com

Join by H.323

**Ex. 6 Personal Privacy (PP)** (US West)  
(US East)

Meeting ID: **Ex. 6 Personal Privacy (PP)**



Message

---

**From:** Peter Zalzal [pzalzal@edf.org]  
**Sent:** 10/21/2022 2:21:28 PM  
**To:** Goffman, Joseph [Goffman.Joseph@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Giles, Cynthia [Giles.Cynthia@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Charmley, William [charmley.william@epa.gov]  
**CC:** Vickie Patton [vpattton@edf.org]; Chester France [cjfrance@sbcglobal.net]  
**Subject:** New Medium and Heavy-Duty Truck Analysis  
**Attachments:** EDF\_HDV\_Manuf\_Memo\_20Oct2022\_flat.pdf; edf-zev-baseline-technical-memo-addendum.pdf; 20220909 EDF EPA IRA 2022-MDHD-Final.pdf; ERM-EDF-Electric-Vehicle-Market-Report\_September2022.pdf  
  
**Flag:** Follow up

Dear EPA Officials:

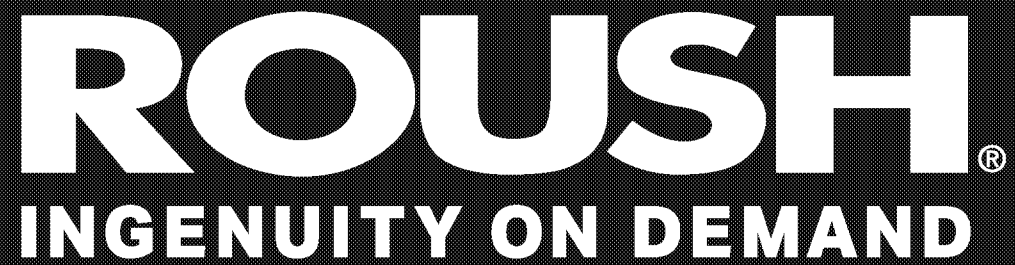
We have attached a new, draft analysis by ERM that evaluates medium- and heavy-duty vehicles broken out by vehicle make and engine manufacturer. The goal of the analysis was to get a better understanding of the key vehicle and engine manufacturers within the MHDV market as a whole, as well as by individual vehicle classes, and the analysis underscores the significant share of new vehicles sold by Ford and GM, particularly in classes 3-6.

In addition, today we are planning to submit a short supplemental comment letter to the docket, including 3 recent analyses that support more protective pollution standards for medium- and heavy-duty vehicles through model year 2029 that consider and reflect the game-changing investments in the Inflation Reduction Act. The first is an analysis by ERM of baseline levels of ZEV deployment considering investments in the IRA. The second is an update of the analysis Roush Engineering undertook to incorporate IRA investments into its assessment of upfront cost parity and TCO for medium- and heavy-duty zero-emitting vehicles. And the third is ERM's recent EV Market Update, which includes a new section on the significant investments and market developments related to zero-emitting medium- and heavy-duty trucks.

We have also reattached those analyses here and we would be happy to discuss any of these critical in greater detail. Best wishes,

Peter

This e-mail and any attachments may contain confidential and privileged information. If you are not the intended recipient, please notify the sender immediately by return e-mail, delete this e-mail and destroy any copies. Any dissemination or use of this information by a person other than the intended recipient is unauthorized and may be illegal.



## **Inflation Reduction Act 2022 Impact Study**

Himanshu Saxena, Sawyer Stone, Vishnu Nair, Sajit Pillai

September 9th, 2022

EDF

# Agenda

- Review of Previous MD/HD Study
- Purpose of Briefing
- Quantitative Impact
- Diesel Price Sensitivity Analysis
- Qualitative Assessment
- Appendix

# Review of Previous MD/HD Study

- Previous study evaluated the cost of electrifying MD/HD vehicles in key market segments\*
  - Incremental cost of powertrain
  - Total Cost of Ownership (TCO)
- Assumptions
  - Study accounts for electrification cost of representative class 3-8 vehicles in MY2027
  - Differential BEV costs based on differences in direct manufacturing cost (DMC) of powertrains, assuming equal RPE's for diesel vehicles and BEVs
  - 50% market adoption of EVs to achieve economies of scale in 2027
- Different depot chargers considered depending on the case
- Detailed inputs included in Appendix

\*V. Nair *et. al.* , Technical Review of Medium and Heavy-Duty Electrification Costs for MY 2027-2030, February 2022 ([https://blogs.edf.org/climate411/files/2022/02/EDF-MDHD-Electrification-v1.6\\_20220209.pdf](https://blogs.edf.org/climate411/files/2022/02/EDF-MDHD-Electrification-v1.6_20220209.pdf))

# Purpose of Briefing

- Assess and quantify where possible the key effects of the Inflation Reduction Act (IRA) 2022 on Roush's previous report on the cost of electrifying medium- and heavy-duty (MD/HD) vehicles
- Results are with respect to the Reference case published in the original study\*
- Assumptions
  - Previous report costing projections were limited to MY2027 for TCO analysis
  - Incremental cost of powertrain was assessed for MY2021, MY2024, and MY2027
  - The provision *Qualified Commercial Clean Vehicles* comes into effect from January 1, 2023
  - To evaluate the nearer term impacts of IRA, previous MY2021 costs have been used as a substitute for MY2023 projections
  - TCO purchase price differences are based on the incremental cost
- Vehicle purchase and charger equipment credits addressed quantitatively
- Other aspects of IRA addressed qualitatively

\*V. Nair et. al. , Technical Review of Medium and Heavy-Duty Electrification Costs for MY 2027-2030, February 2022 ([https://blogs.edf.org/climate411/files/2022/02/EDF-MDHD-Electrification-v1.6\\_20220209.pdf](https://blogs.edf.org/climate411/files/2022/02/EDF-MDHD-Electrification-v1.6_20220209.pdf))

# Impact Analysis of Inflation Reduction Act 2022

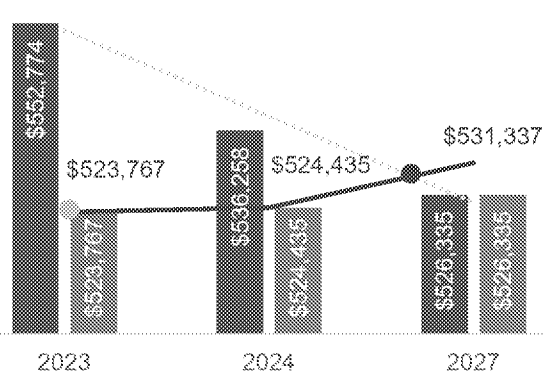
SUBTITLE	PART	SECTION	IMPACT
Subtitle D— Energy Security	PART 4—CLEAN VEHICLES	SEC. 13403. QUALIFIED COMMERCIAL CLEAN VEHICLES.	Direct
		SEC. 13404. ALTERNATIVE FUEL REFUELING PROPERTY CREDIT.	Direct
	PART 5—INVESTMENT IN CLEAN ENERGY MANUFACTURING AND ENERGY SECURITY	SEC. 13501. EXTENSION OF THE ADVANCED ENERGY PROJECT CREDIT.	Indirect
		SEC. 13502. ADVANCED MANUFACTURING PRODUCTION CREDIT.	Indirect
	PART 7—INCENTIVES FOR CLEAN ELECTRICITY AND CLEAN TRANSPORTATION	SEC. 13701. CLEAN ELECTRICITY PRODUCTION CREDIT. & SEC. 13702. CLEAN ELECTRICITY INVESTMENT CREDIT.	Indirect
Subtitle A—Energy	PART 4—DOE LOAN AND GRANT PROGRAMS	SEC. 50141. FUNDING FOR DEPARTMENT OF ENERGY LOAN PROGRAMS OFFICE.	Indirect
		SEC. 50142. ADVANCED TECHNOLOGY VEHICLE MANUFACTURING.	Indirect
		SEC. 50143. DOMESTIC MANUFACTURING CONVERSION GRANTS.	Indirect
		SEC. 50144. ENERGY INFRASTRUCTURE REINVESTMENT FINANCING.	Indirect
	PART 6—INDUSTRIAL	SEC. 50161. ADVANCED INDUSTRIAL FACILITIES DEPLOYMENT PROGRAM.	Indirect
Subtitle A—Air Pollution		SEC. 60101. CLEAN HEAVY-DUTY VEHICLES.	Indirect
		SEC. 60102. GRANTS TO REDUCE AIR POLLUTION AT PORTS.	Indirect
		SEC. 60103. GREENHOUSE GAS REDUCTION FUND.	Indirect
		SEC. 60104. DIESEL EMISSIONS REDUCTIONS.	Indirect

Indirect Direct

# Quantitative Assessment

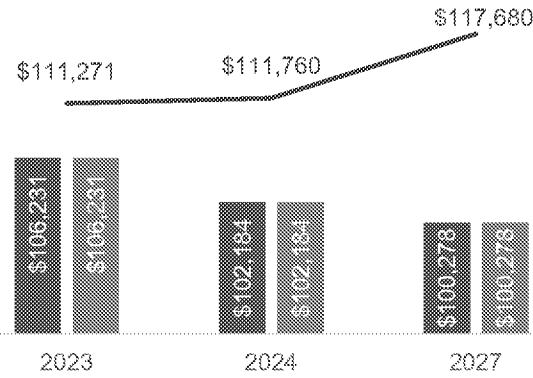
# Purchase Price (Reference Case)

C8 Transit

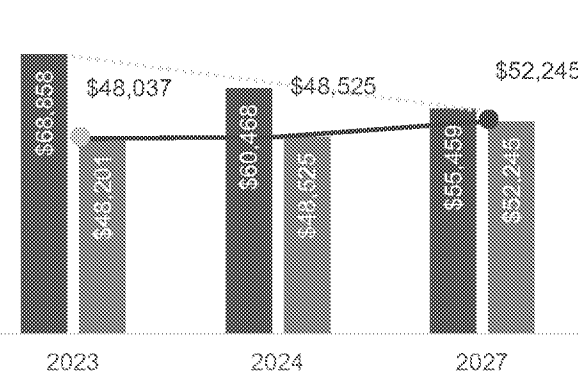


Parity accelerated

C7 School Bus

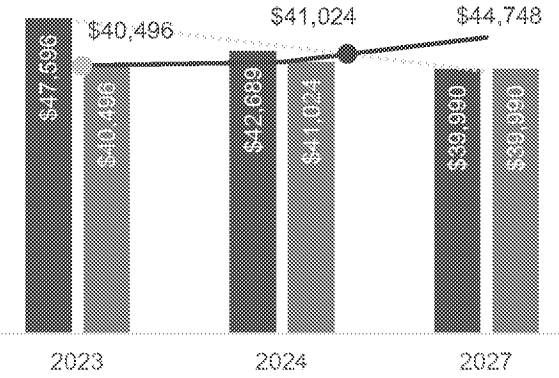


C5 Shuttle Bus



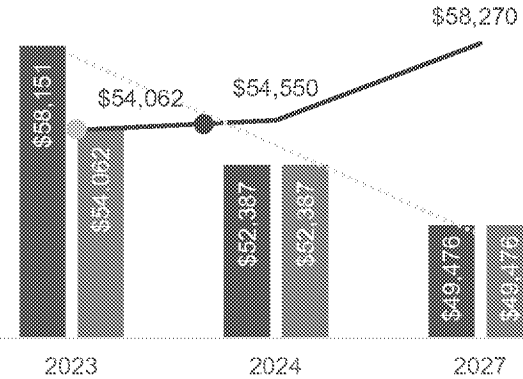
Parity accelerated

C3 Delivery Van



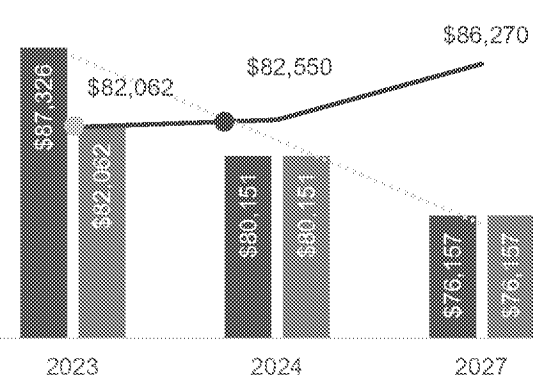
Parity accelerated

C5 Delivery Truck



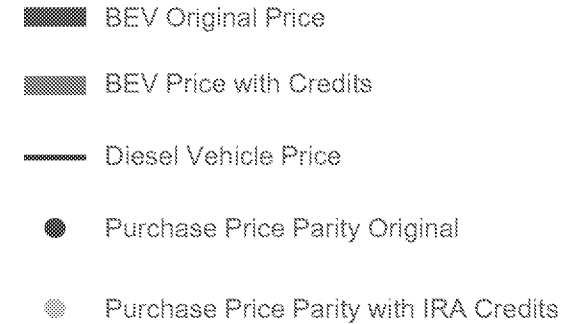
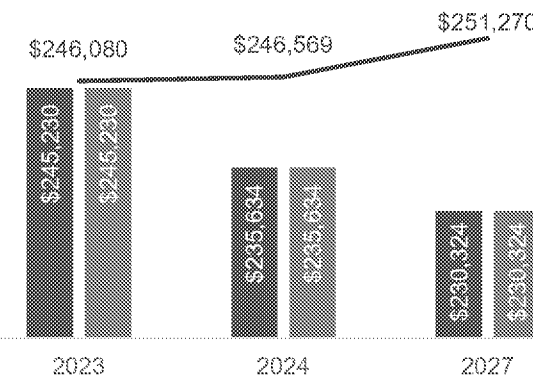
Parity accelerated

C7 Delivery Truck



Parity accelerated

C8 Refuse Hauler

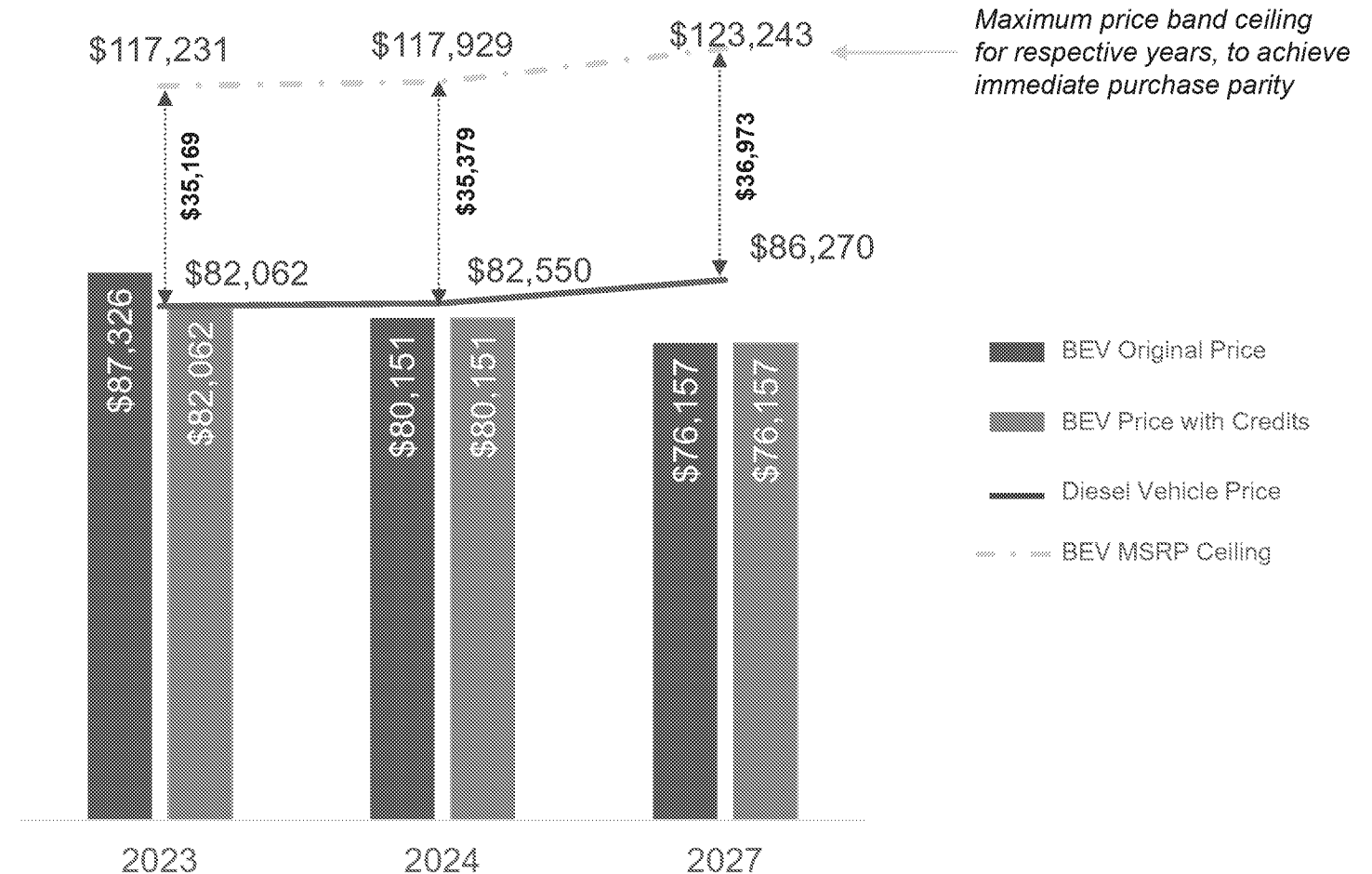


- IRA credits accelerate purchase parity of C8 Transit, C5 Shuttle, C3 Van, C5 Delivery, and C7 Delivery to Immediate

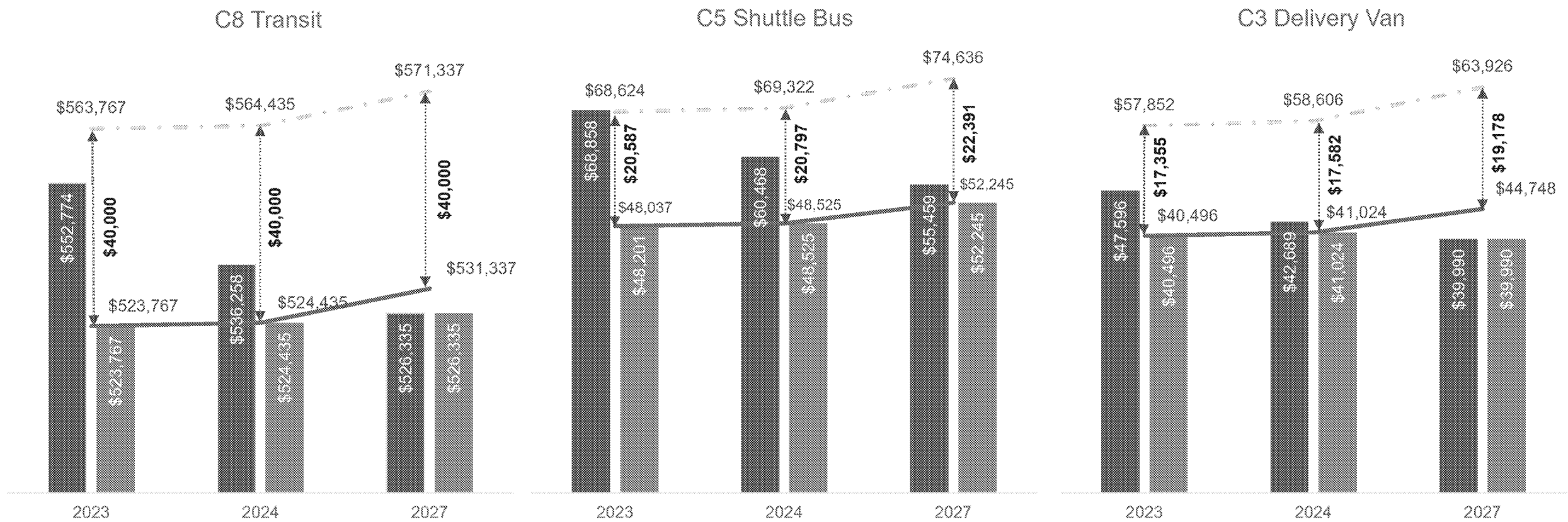


# Purchase Price Band C7 Delivery Truck

- Establish MSRP ceiling to define price tolerance band to avail credits
- BEV MSRP ceiling based on diesel vehicle price
- Maximum price of a 2023/2024 C7 delivery BEV can be ≈\$118,000 and still achieve immediate purchase parity
- Though not an IRA requirement, the band provides a buffer to:
  - increase battery size
  - absorb battery price fluctuations
  - develop domestic supply chain



# Purchase Price Band (Reference Case)



- Credits provide ‘cushion’ to automakers to launch cost competitive BEVs

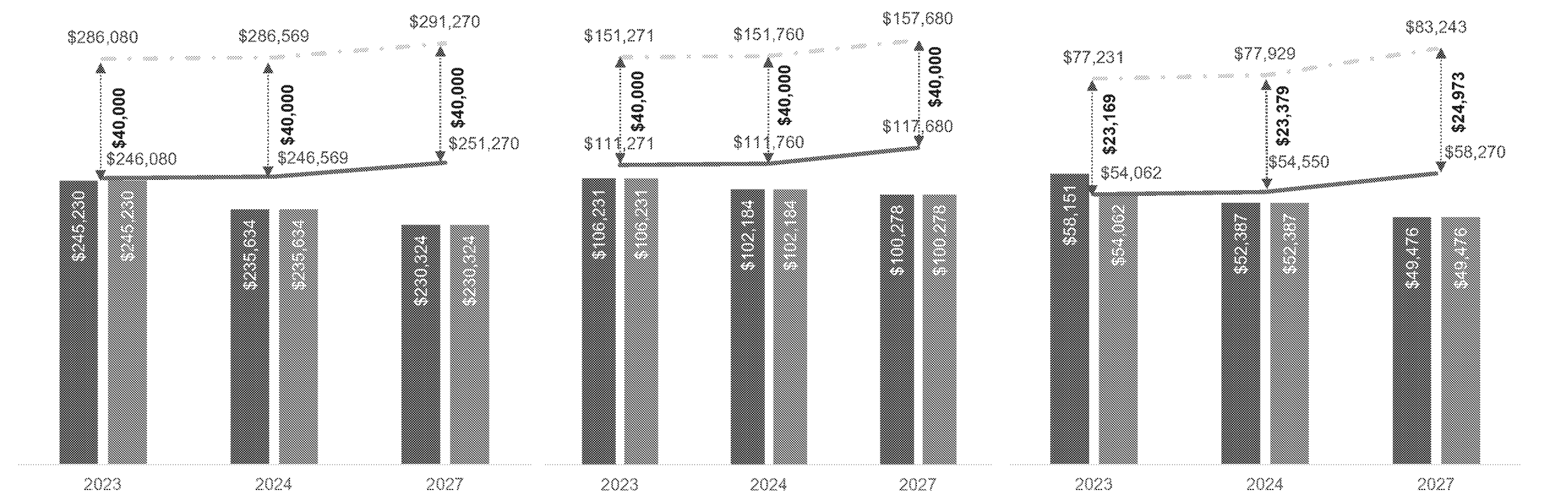
# Purchase Price Band (Reference Case)

- BEV Original Price
- BEV Price with Credits
- Diesel Vehicle Price
- BEV MSRP Ceiling

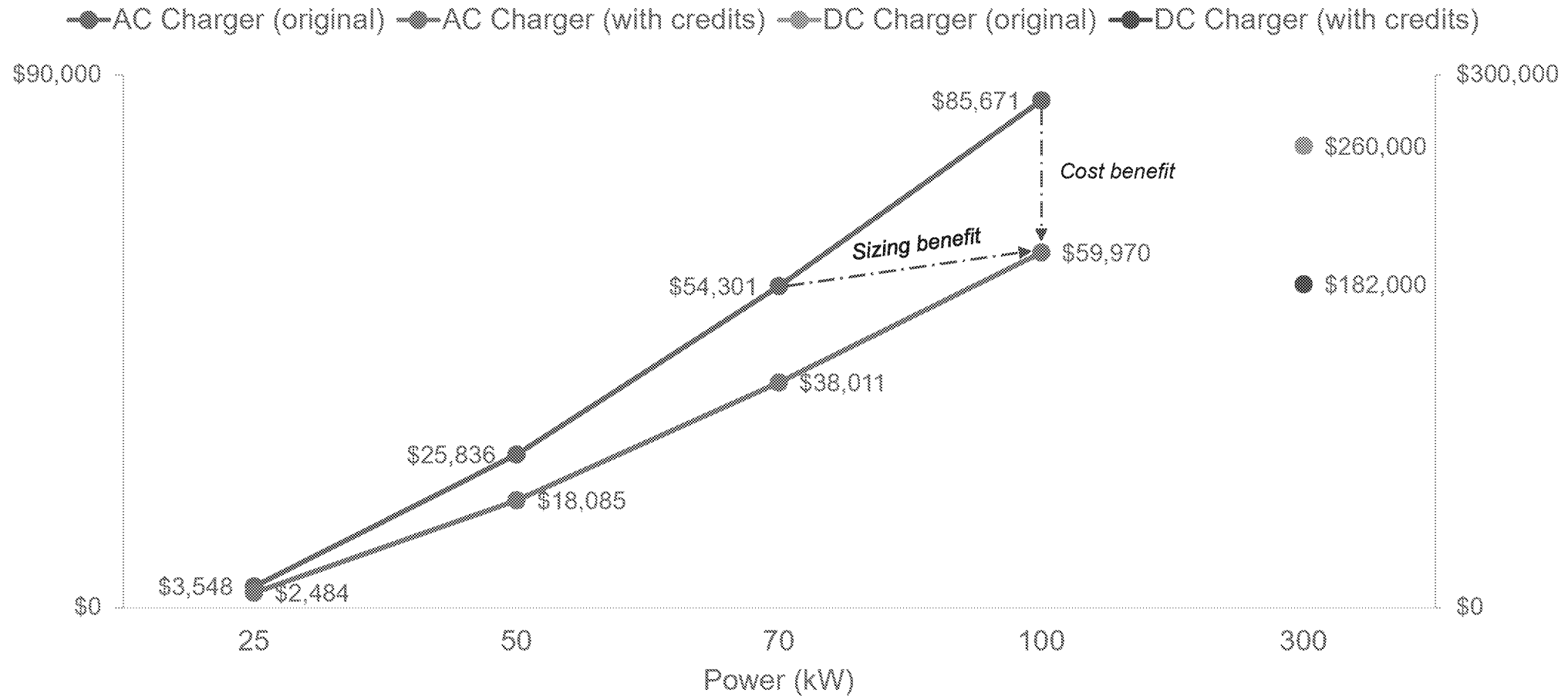
C8 Refuse Hauler

C7 School Bus

C5 Delivery Truck

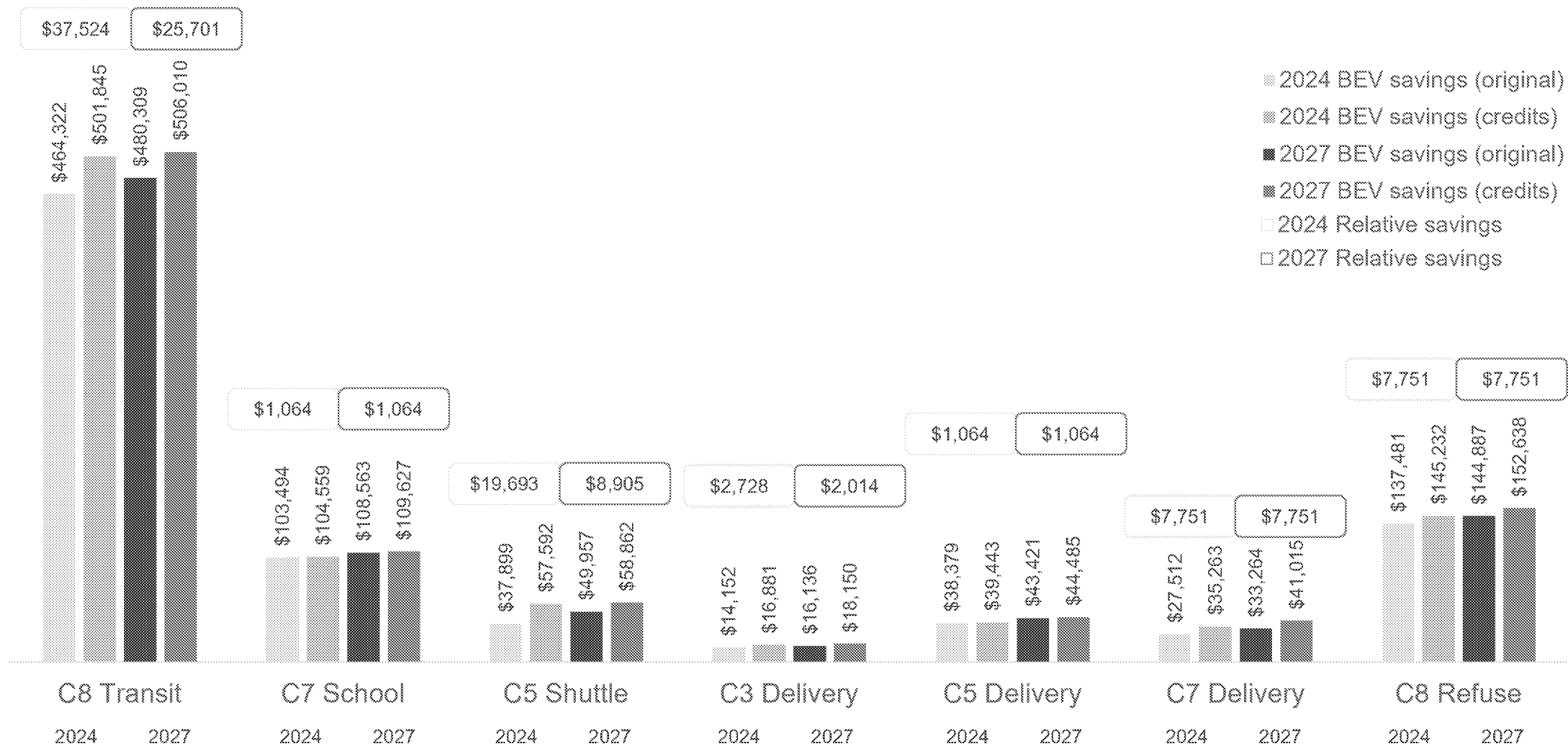


# Charger Costs



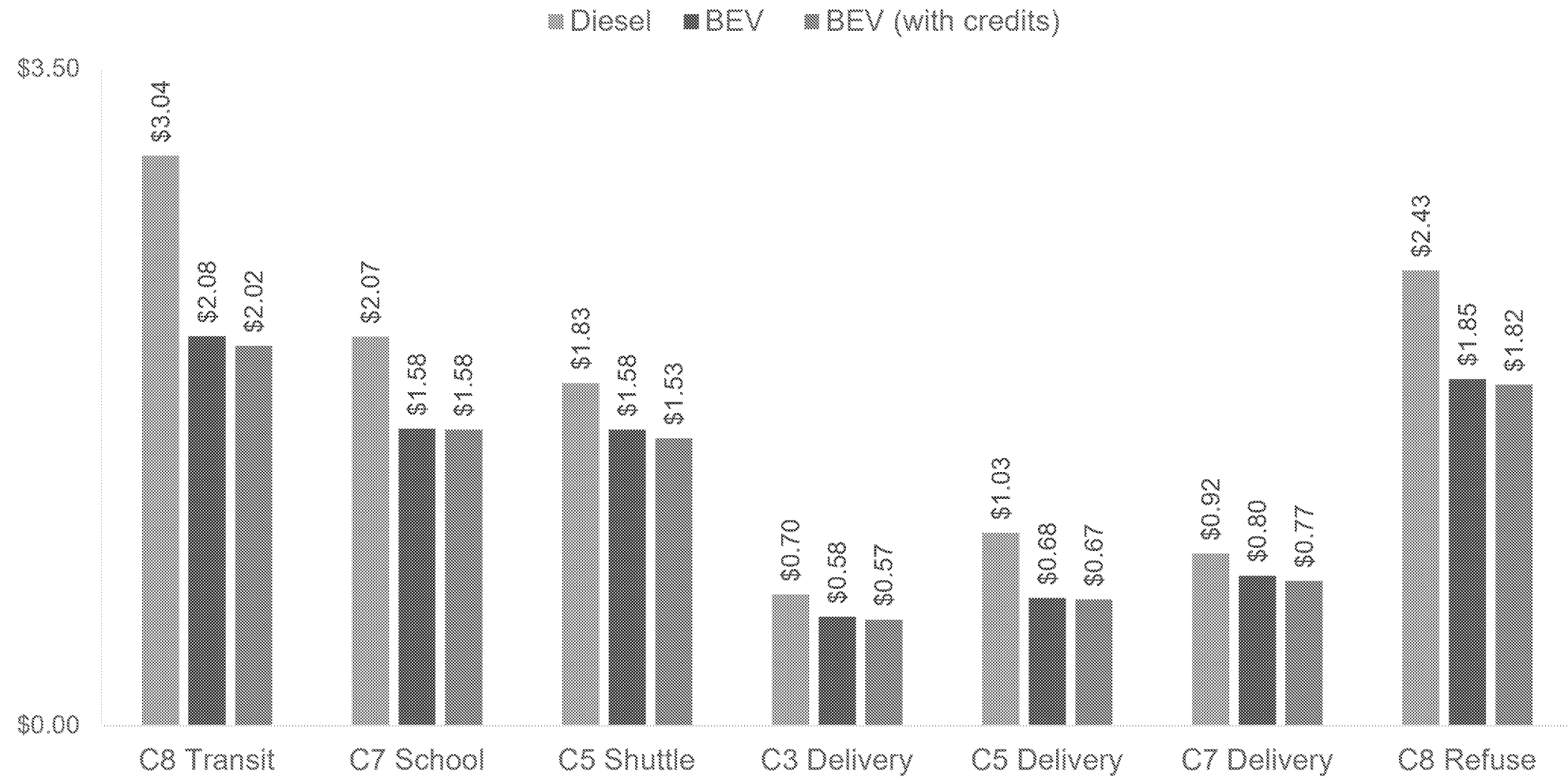
- 30% discount applied to charger equipment and not its installation cost
- Charger savings vary anywhere from \$1,064 to \$25,701 (DCFC shared by 3 vehicles)

# Cumulative Net Savings (Reference Case)



- Cumulative net savings of a BEV purchased in 2024 and 2027 over diesel over its lifetime

# TCO Per Mile from 2027 (Reference Case)

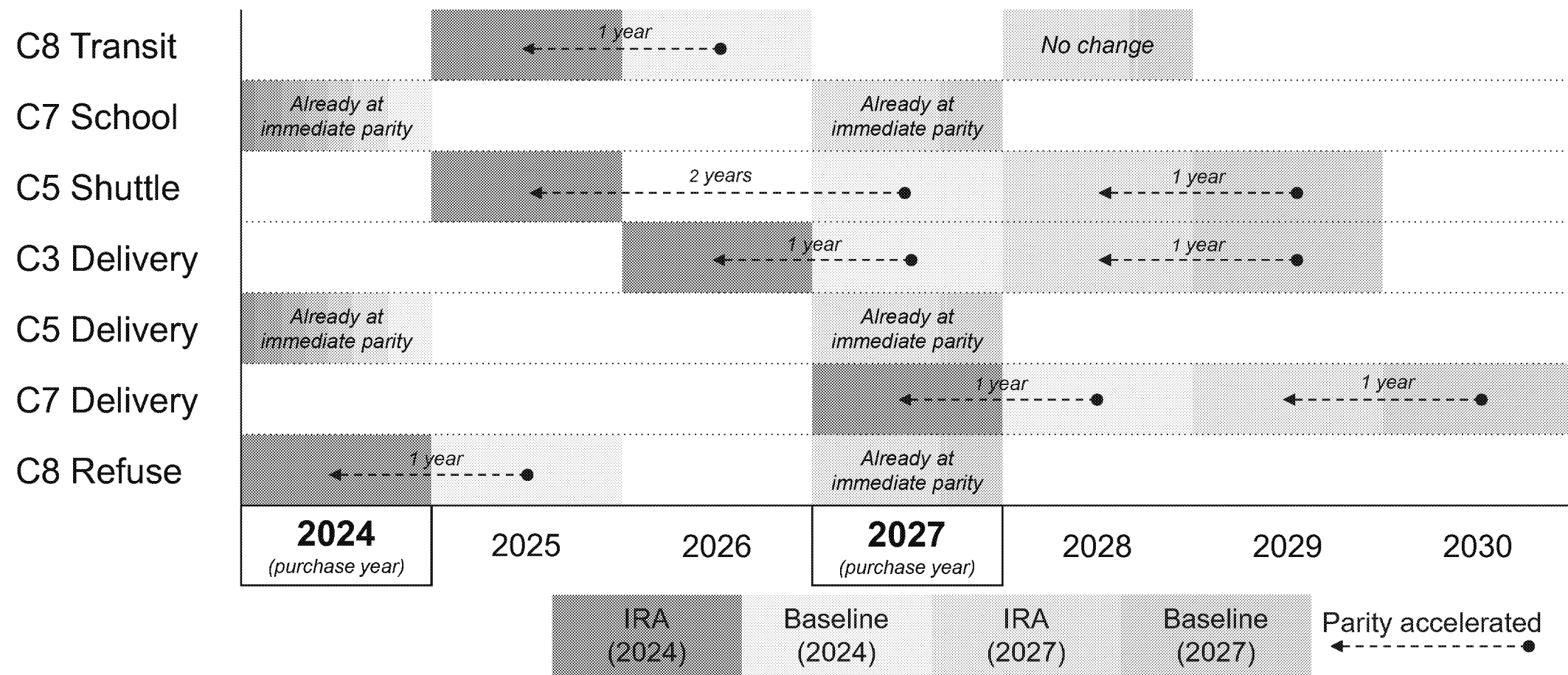


- IRA credits reduces the cost of ownership further compared to baseline

# Year TCO Parity Reached from 2024 and 2027 in Original Study

Vehicle Type	2024 Purchase Timeframe		2027 Purchase Timeframe	
	Year	Time to Parity	Year	Time to Parity
C8 Transit	2026	2 years	2028	1 year
C7 School	2024	Immediate	2027	Immediate
C5 Shuttle	2027	3 years	2029	2 years
C3 Delivery	2027	3 years	2029	2 years
C5 Delivery	2024	Immediate	2027	Immediate
C7 Delivery	2028	4 years	2030	3 years
C8 Refuse	2025	1 year	2027	Immediate

# Time to Reach Parity (Reference Case)



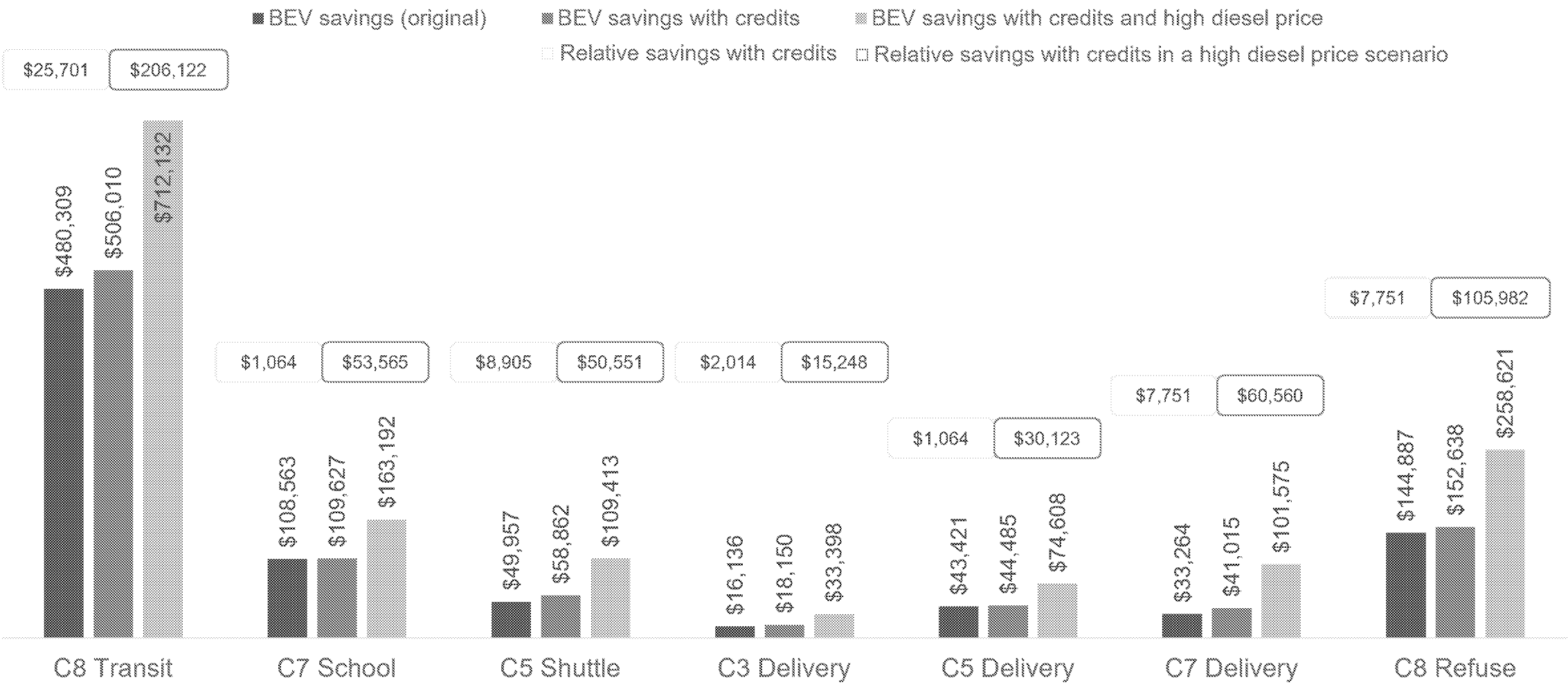
- Intra-year comparison of 2024 and 2027 considered with credits against their baselines respectively
- For 2024, only purchase price varied w.r.t. 2027; charger costs and operating expenses are the same
- Credits accelerate the time to breakeven by 1-2 years



# High Diesel Price

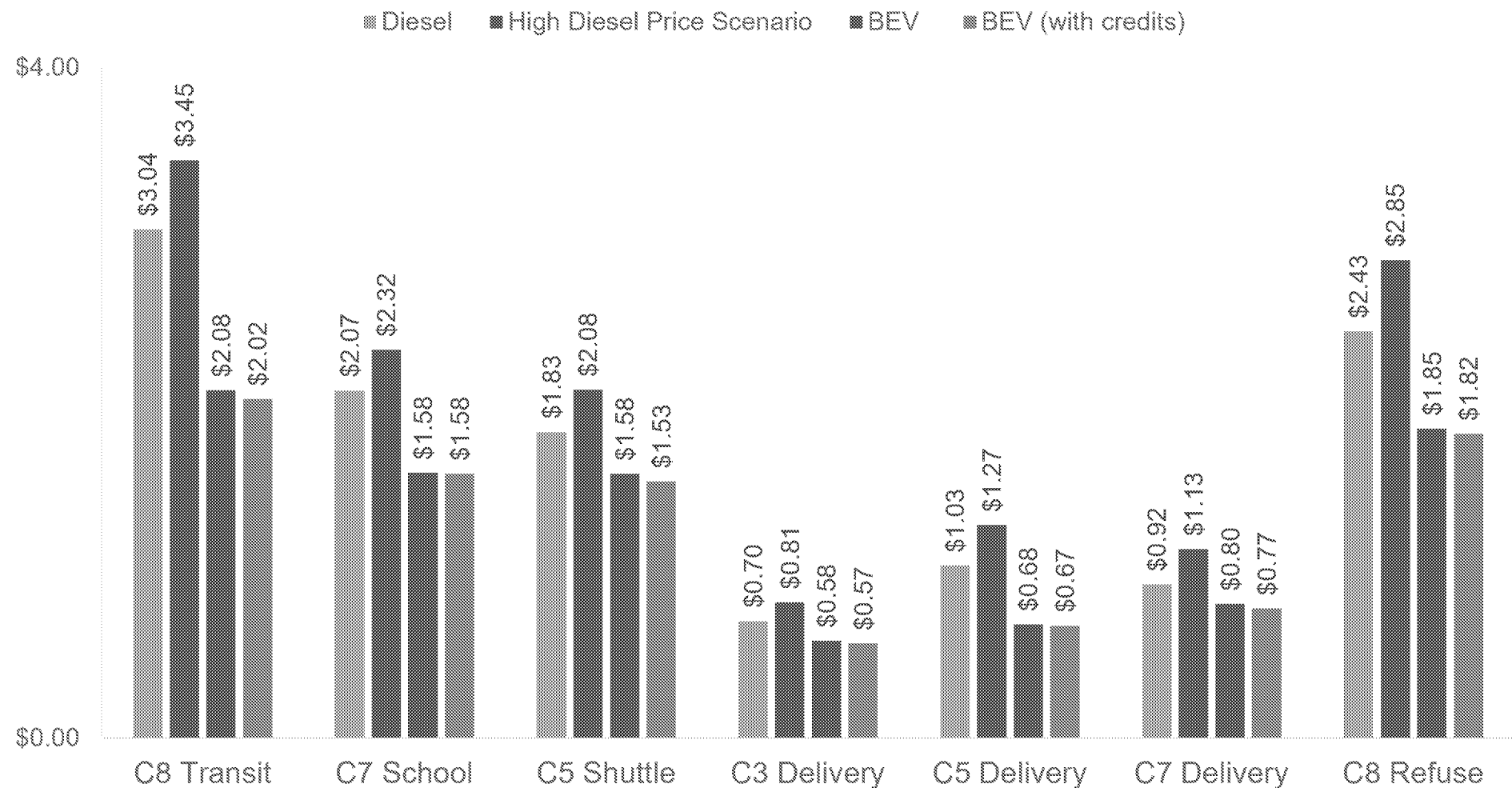
Sensitivity Analysis for 2027 timeframe

# Additional Savings from 2027 (Reference Case)



- High Diesel Price of \$5.18 (June 2022 without taxes) results in further savings
- Savings of a BEV with IRA credits over a comparable ICE with high diesel price

# TCO Per Mile from 2027 (Reference Case)



- IRA credits reduces the cost of ownership further compared to baseline

# Qualitative Assessment

# Qualitative Assessment

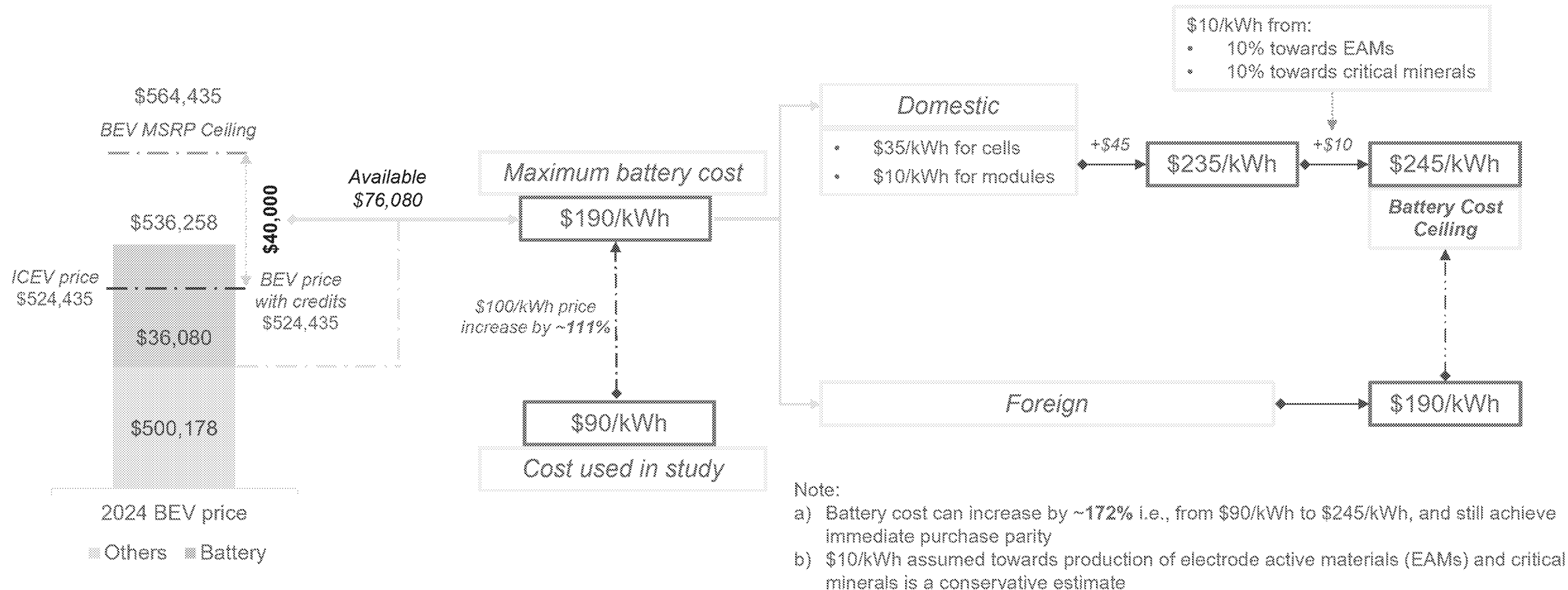
SECTION	IMPACT	ENDPOINT
EXTENSION OF THE ADVANCED ENERGY PROJECT CREDIT (\$10 bn.)	<ul style="list-style-type: none"><li>Stimulate and scale up domestic manufacturing</li><li>Develop clean energy supply chains</li></ul>	<ul style="list-style-type: none"><li>Benefits automakers and EV battery makers</li><li>Promotes advanced <b>MD/HDVs</b> manufacturing</li></ul>
ADVANCED MANUFACTURING PRODUCTION CREDIT (details on next slide)		
CLEAN ELECTRICITY PRODUCTION CREDIT & INVESTMENT CREDITS	<ul style="list-style-type: none"><li>Energy Generation related credits</li><li>Promotes clean electricity technologies</li></ul>	<ul style="list-style-type: none"><li>Benefits utility providers</li><li>0.3-1.5 ¢/kWh</li><li>Technology-neutral credits from 2025</li></ul>
FUNDING FOR DOE LOAN PROGRAMS OFFICE (\$3.6bn., +\$40 bn.)		
ADVANCED TECHNOLOGY VEHICLE MANUFACTURING (\$3 bn.)	<ul style="list-style-type: none"><li>Increase domestic supply of critical minerals through production, processing, manufacturing, recycling or fabrication of mineral alternatives</li><li>Domestic production of HEVs, PHEVs, PEVs and FCEVs</li><li>Emission reduction technologies in energy infrastructure</li><li>Reducing emissions from energy intensive industries</li></ul>	<ul style="list-style-type: none"><li>Benefits upstream operators, automakers, battery makers, and energy producers</li><li>Secures supply chain</li></ul>
DOMESTIC MANUFACTURING CONVERSION GRANTS (\$2 bn.)		
ENERGY INFRASTRUCTURE REINVESTMENT FINANCING (\$5 bn.)		
ADVANCED INDUSTRIAL FACILITIES DEPLOYMENT PROGRAM (\$5.812 bn.)		
CLEAN HEAVY-DUTY VEHICLES (\$1 bn.)		
GRANTS TO REDUCE AIR POLLUTION AT PORTS (\$3 bn.)	<ul style="list-style-type: none"><li>Replace C6 and C7 HDVs with ZEVs</li><li>Purchase &amp; installation of zero- emission eqpt. and tech.</li><li>Deploy low- and zero- emission technologies</li><li>DERA grants to identify and reduce diesel emissions</li></ul>	<ul style="list-style-type: none"><li>Encourages adoption of <b>C6 &amp; C7 school BEVs</b></li><li>Enables the electrification of <b>drayage</b> market</li><li>Discourage diesel vehicles for goods movement</li></ul>
GREENHOUSE GAS REDUCTION FUND (\$27 bn.)		
DIESEL EMISSIONS REDUCTIONS (\$60 mn.)		
TAX INCENTIVES	FUNDING & FINANCING	DECARBONIZATION & EMISSION REDUCTION PROGRAMS

# Advanced Manufacturing Production Credit

Battery Materials	Phase Out											
	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Electrode active materials	10%	10%	10%	10%	10%	10%	10%	10%	7.5%	5%	2.5%	0%
Cells (\$/kWh)	\$35	\$35	\$35	\$35	\$35	\$35	\$35	\$35	\$26.3	\$17.5	\$8.8	0
Modules (\$/kWh)	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$10	\$7.5	\$5	\$2.5	0
Modules that don't use cells (\$/kWh)	\$45	\$45	\$45	\$45	\$45	\$45	\$45	\$45	\$33.8	\$22.5	\$11.3	0
Production of Critical Minerals (phase out doesn't apply)	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

- 30% investment tax credit and manufacturing production credits available
- Manufacturers can avail only one of the two credits
- These credits not considered for quantitative impact since:
  - sources considered in original costing not limited by geography
  - limited producers in the U.S.
  - volume manufacturing in near term would take some time to ramp up

# Hypothetical Application of Credits on C8 Transit



- 400 kWh battery size assumed for C8 Transit Bus
- Additionally, 30% investment credit is available which can be availed by the manufacturers, if
  - the cell maker is separate from EV manufacturer
  - they did not avail the manufacturing credit

# References

1. H.R.5376 - Inflation Reduction Act of 2022 (<https://www.congress.gov/bill/117th-congress/house-bill/5376/text>)
2. Title 26 of the CFR (<https://www.ecfr.gov/current/title-26>)
3. Title 42 of the CFR (<https://www.ecfr.gov/current/title-42>)
4. Congressional Committee Reports
5. <https://www.eia.gov/>
6. *V. Nair et. al.* ,Technical Review of Medium and Heavy-Duty Electrification Costs for MY 2027-2030, February 2022 ([https://blogs.edf.org/climate411/files/2022/02/EDF-MDHD-Electrification-v1.6\\_20220209.pdf](https://blogs.edf.org/climate411/files/2022/02/EDF-MDHD-Electrification-v1.6_20220209.pdf))



# Appendix

# Technical Review of Medium and Heavy-Duty Electrification Costs for MY 2027-2030

## Inputs for Total Cost of Ownership (TCO) Analysis

Vehicle Type	Lifetime Mileage (miles)			Lifetime Age of a Vehicle (years)			Battery Capacity (kWh)
	Low	Reference	High	Low	Reference	High	
Transit – Class 8	331,200	500,000	652,836	12	12	12	400
School Bus – Class 7	221,120	221,120	425,000	10	10	10	60
Shuttle – Class 5	100,000	200,000	200,000	7	7	7	200
Delivery Van – Class 3	124,350	136,785	231,000	10	11	11	100
Delivery – Class 5	124,350	124,350	148,000	10	10	10	150
Delivery – Class 7	250,000	285,710	360,000	10	10	10	100
Refuse – Class 8	175,000	250,000	300,000	12	10	7	200

# Technical Review of Medium and Heavy-Duty Electrification Costs for MY 2027-2030

- Incremental Vehicle Cost
  - ICE Powertrain
    - Reference Case – Base diesel system (no hybridization)
    - Sensitivity case 1 - mild hybrid powertrain (48V)
    - Sensitivity case 2 - full hybrid powertrain
  - Battery
    - Reference Case – NMC Batteries, Heavy Duty (HD) Motors
    - Sensitivity case 1 – LFP batteries, HD Motors
    - Sensitivity case 2 – LFP batteries + Light duty (LD) motors
- TCO: 3 Scenarios projected – Diesel and EV
  - Low: Best case fuel, vehicle, maintenance costs; 6-hour depot charging
  - Reference: Average purchase price, fuel, maintenance, 4-hour depot charging
  - High: worst-case costs of vehicle, fuel, maintenance, 4-hour depot charging, 1/3 DCFC

Powertrain Sensitivity

Diesel	Base	Mild Hybrid	Full Hybrid
BEV	LFP + LD motors	LFP + HD motors	NMC + HD motors
BEV Charger	Depot chargers	Depot chargers	3 vehicles per DCFC

Energy costs used for the three TCO cases

Case	Diesel (\$/gal)*	Electricity (\$/kWh)*
Low	2.10	0.07
Reference	3.25	0.12
High	4.61	0.15

\*Not based on EIA AEO 2022

# Technical Review of Medium and Heavy-Duty Electrification Costs for MY 2027-2030

- Type of chargers considered
  - AC Chargers
    - 25 kW
    - 50 kW
    - 70 kW
    - 100 kW
  - DC Charger 300+ kW (shared by 3 vehicles)
- Charger installation costs considered separately

# **ROUSH®**

**INGENUITY ON DEMAND**

Message

---

**From:** Vickie Patton [vpatton@edf.org]  
**Sent:** 8/17/2022 12:45:21 AM  
**To:** Goffman, Joseph [Goffman.Joseph@epa.gov]; Enobakhare, Rosemary [Enobakhare.Rosemary@epa.gov]; Cortez Russell, Loni [Russell.Loni@epa.gov]; Arroyo, Victoria [Arroyo.Victoria@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Charmley, William [charmley.william@epa.gov]; Tsirigotis, Peter [Tsirigotis.Peter@epa.gov]; Culligan, Kevin [Culligan.Kevin@epa.gov]; Profeta, Timothy [Profeta.Timothy@epa.gov]  
**CC:** Peter Zalzal [pzalzal@edf.org]  
**Subject:** The Inflation Reduction Act includes Historic Modernization of the Clean Air Act  
**Attachments:** IRA Includes Historic Modernization of Clean Air Act - EDF white paper\_ (Final).pdf

Dear EPA Officials,

Multiple modeling analyses have been carried out examining the historic climate and clean energy investments in the Inflation Reduction Act.

EDF issued analysis today examining the complementary, varied and consequential provisions included in the Inflation Reduction Act that reflect historic modernization of the Clean Air Act. It is attached here for your consideration.

Thank you for your public service.

Sincerely yours,  
Vickie Patton

This e-mail and any attachments may contain confidential and privileged information. If you are not the intended recipient, please notify the sender immediately by return e-mail, delete this e-mail and destroy any copies. Any dissemination or use of this information by a person other than the intended recipient is unauthorized and may be illegal.

August 15, 2022

## ***The Inflation Reduction Act Includes Historic Modernization of the Clean Air Act for the American People***

Multiple analyses of the Inflation Reduction Act forecast that the legislation will slash climate-warming gases 40% below 2005 baseline levels by 2030. These reductions will be achieved by making historic climate and clean energy investments totaling \$369 billion. Those incentives create a tremendous pull on the supply side for climate and clean energy solutions that reduce climate and air pollution.

EDF has taken a closer look at the crucial ways the Inflation Reduction Act also creates a complementary push on the demand side to accelerate clean solutions through historic modernization of the Clean Air Act – our nation’s bedrock law that requires rigorous limits on climate and other air pollutants based on the best available technologies.

Creating incentives that propel climate and clean energy investments works in tandem with the Clean Air Act limits on pollution. The incentives under the Inflation Reduction Act will drive down the cost of clean solutions. Because the availability and cost of pollution abatement technologies are key factors in EPA’s establishment of national emission standards under the Clean Air Act, decreasing the cost of clean solutions will, in turn, increase the pollution reduction protections for the American people.

### **The bottom line: Congress has modernized the Clean Air Act to re-enforce and expand EPA’s authority to protect American families from climate and air pollution**

In accordance with science reflecting the extreme urgency of reducing climate hazards, the United States has committed to reduce climate-destabilizing pollution by at least 50% over 2005 levels by 2030. The Inflation Reduction Act will help us get there through its major investments in clean energy, together with strengthened protections under the modernized Clean Air Act. These advances will work alongside other important actions from across the federal government, action by the states, tribes and local governments, private sector leadership and innovation, and investments in communities and neighborhoods. The new legislation does not just invest in clean energy incentives; it broadens and deepens our national capacity to confront climate change.

The new legislation bolsters EPA’s authority and responsibility to address climate change, including through the addition of many entirely new sections to the Clean Air Act. In the Inflation Reduction Act, Congress has enacted the most far-reaching changes to the Clean Air Act since 1990. These new Clean Air Act sections and the new provisions that rely on the Clean Air Act reinvigorate EPA’s responsibilities under the law addressing the climate crisis and long-standing

inequities with new tools, new solutions, unprecedented investments, additional policies, and with great urgency.

Here are some of the ways the Inflation Reduction Act does just that:

- **Reaffirming greenhouse gases' status as air pollutants**

Among the new law's most significant features is an emphatic reaffirmation of EPA's duty to take action to reduce climate pollution. In numerous instances, the new law references greenhouse gases and confirms their status as air pollutants under the Clean Air Act, reinforcing the long-standing Supreme Court ruling in *Massachusetts v. EPA*, 549 U.S. 497 (2007), and subsequent judicial and administrative precedent.

The amendments repeatedly enumerate each of the principal climate-destabilizing gases that EPA identified following the *Massachusetts* decision, providing more than a dozen times that:

*the term 'greenhouse gas' means the air pollutants carbon dioxide, hydrofluorocarbons, methane, nitrous oxide, perfluorocarbons, and sulfur hexafluoride*

These Congressional definitions confirm with a new fresh legislative imprimatur what had already become well entrenched in a decade and a half of judicial decisions and agency actions: that greenhouse gases are air pollutants under the Clean Air Act, and that these include the warming gases carbon dioxide, hydrofluorocarbons, methane, nitrous oxide, perfluorocarbons, and sulfur hexafluoride. The new law lays out a wide array of new and bolstered tools for EPA, states, community groups, companies, and others, to reduce harms to public health and welfare from these harmful pollutants.

- **Environmental and Climate Justice block grants for community-led protections, including more inclusive participation in federal and state policy-making**

In the new law, Congress made Clean Air Act history by giving those most at risk from climate change and other forms of air pollution central roles in developing solutions. For far too long, urgent action on the environmental injustices wrought by climate and air pollution has been impeded by policymakers lacking will, forces claiming EPA lacked authority, and the failure to invest in community centered and community-forged solutions. The new legislation takes a step forward in addressing these impediments to progress, providing EPA with new authority, new resources, and community-led investments to advance environmental and climate justice.

In the Inflation Reduction Act, Congress has added a new section to the Clean Air Act – section 138 – to provide EPA with \$3 billion for grants and technical assistance to support community-led responses to climate and air pollution, including climate resilience. The grants must benefit disadvantaged communities and may be awarded for community-led air and other pollution monitoring, prevention, and remediation, and investments in low- and zero-emission and resilient technologies and related infrastructure and workforce development that help reduce greenhouse gas emissions and other air pollutants.

Importantly, grants may be directed to more inclusive and just participation by communities in federal and state policymaking, including “facilitating engagement of disadvantaged communities in State and Federal advisory groups, workshops, rulemakings, and other public processes.” The grants may also be directed to reducing health risks imposing particularly heavy burdens on both urban and rural communities, such as “mitigating climate and health risks from urban heat islands, extreme heat, wood heater emissions, and wildfire events.”



Congress has also recognized the vulnerability disadvantaged communities face in the climate crisis and made these resources available for climate resilience and adaptation.

- **Greenhouse Gas Reduction Fund for grants and financing to benefit low-income and disadvantaged communities**

New section 134 of the Clean Air Act will include a multi-billion dollar grant and financing program to ensure that the climate, health and economic benefits of zero-emitting solutions are more widely available and more equitably shared. EPA will have \$7 billion for grants “to enable low-income and disadvantaged communities to deploy or benefit from zero emission technologies, including distributed technologies on residential rooftops.” An additional \$12 billion is available for general assistance and another \$8 billion for assistance in low-income and disadvantage communities. These resources may provide direct assistance to communities “to reduce or avoid greenhouse gas emissions and other forms of air pollution,” and may be leveraged with private sector investments.

- **Strengthening tools to address community pollution burdens from heavy-duty vehicles, ports and goods movement**

The movement of goods by freight trucks on high traffic surface streets and highways, at warehouses and freight depots, and through ports and freight equipment creates dangerous concentrations of pollution that afflict nearby communities and neighborhoods and contributes large volumes of climate pollution. The Inflation Reduction Act strengthens EPA’s long-standing authorities to make progress on each of these serious pollution challenges.

*Zero-emitting heavy-duty vehicles*

Congress has added new section 132 of the Clean Air Act providing \$1 billion for zero-emitting class 6 or 7 heavy-duty vehicles with 40% of the resources directed to communities in “nonattainment” areas – i.e., areas suffering from persistent failures to meet the Clean Air Act’s health-based national air quality standards. The grants may include the incremental replacement costs of zero-emitting vehicles, charging infrastructure, workforce development and training, planning and deployments. These EPA administered resources will have multiplier effects in addressing the heavy burden of pollution when paired with the extensive tax incentives for heavy-duty vehicles.

*Zero-emitting equipment for ports and comprehensive planning*

New section 133 of the Clean Air Act provides \$3 billion to reduce air pollution at ports through rebates and grants to purchase “zero-emission port equipment,” conduct relevant planning or permitting and for comprehensive climate action plans to reduce greenhouse gases and other air pollutants. One-quarter of these resources are earmarked for nonattainment areas.

*Expanded funding under the Diesel Emissions Reduction Act to protect low-income and disadvantaged communities from goods movement facilities and vehicles*

Congress also provides EPA with \$60 million “to identify and reduce diesel emissions resulting from goods movement facilities, and vehicles servicing goods movement facilities, in low-income and disadvantaged communities to address the health impacts of such emissions on such communities.” These resources are for grants, rebates and loans under the Diesel Emissions Reduction Act (42 U.S.C. § 16132).

- **Monitoring and reducing pollution at schools in low-income and disadvantaged communities**

In the Inflation Reduction Act, Congress invests \$50 million in an EPA Clean Air Act program “to monitor and reduce greenhouse gas emissions and other air pollutants at schools in low-income and disadvantaged communities.” A portion of these resources is committed to supporting technical assistance for schools to develop school environmental quality plans.

- **State, Tribal and Local Government Climate Pollution Reduction Grants for cutting total greenhouse gas pollution and in low-income and disadvantaged communities**

The Inflation Reduction Act adds new section 137 of the Clean Air Act providing EPA with \$5 billion for states, tribes and local governments throughout the country to develop comprehensive plans to carry out reductions in greenhouse gas emissions. The new protections under the Clean Air Act direct \$250 million for planning and \$4.75 billion for implementing those plans. Plans must include “programs, policies, measures, and projects that will achieve or facilitate the reduction of greenhouse gas air pollution.” EPA must require applications to address “the degree to which greenhouse gas air pollution is projected to be reduced in total and with respect to low-income and disadvantaged communities.” Congress has thus provided substantial funding to support tailored climate solutions at every level of government.

- **Reinforcing that zero-emitting vehicles are integral to federal and state clean vehicle programs**

The federal Clean Air Act and state clean air programs have long recognized that zero-emitting vehicles are integral to addressing climate pollution and other airborne contaminants. Although zero-emitting vehicles have been a key part of federally authorized California clean air programs for decades, the understanding that zero-emitting vehicles are vital to clean air goes back decades earlier still: On July 18, 1967, during the Senate’s adoption of provisions in the Air Quality Act of 1967 (S. 780) waiving federal preemption for California’s motor vehicle pollution control program, Republican Senator George Murphy explained Congress’s vision that the “automobile industry. . . should not rest until it produces a pollution-free engine.”

This objective of pollution-free vehicle engines has been repeatedly reaffirmed in succeeding actions of Congress under the modern Clean Air Act. In the Inflation Reduction Act, Congress reaffirmed it again by adding a new Clean Air Act section 132(d)(5) defining the term “zero-emission vehicle” to mean a vehicle with “zero exhaust emissions” of “any air pollutant” listed under the national health-based air quality standards program and “any greenhouse gas.”

The Inflation Reduction Act also expressly recognizes and reinforces state clean- and zero-emitting vehicle programs building on the congressional action first adopted in 1967 and on the foundation repeatedly strengthened and expanded in subsequent amendments to the Clean Air Act. The new legislation contains specific provisions to support “Greenhouse Gas and Zero-Emission Standards for Mobile Sources,” by designating additional funding “to provide grants to States to adopt and implement greenhouse gas and zero emission standards for mobile sources pursuant to section 177 of the Clean Air Act.” This provision both reinforces the long-standing state programs reducing greenhouse gases and providing for zero-emitting vehicles and invests in continued state action to adopt these programs.

- **Accelerating pollution reductions from large emitting sectors including Oil and Gas Methane, Power Plants, and Industrial Sources of HFCs:**

***Methane Emission Reduction Incentive Program for Oil and Gas establishes first-ever pollution fee under U.S. law for potent warming gas***

For the first time ever under federal law, the Inflation Reduction Act imposes a fee on climate pollution – highlighting the critical importance of rapidly slashing methane emissions from oil and gas production. Responsible for 25% of today’s warming, methane is a potent greenhouse gas more than 80 times as powerful as carbon dioxide in the near-term. Methane leakage across the oil and gas supply chain can be readily eliminated with today’s low-cost solutions, leading to far-reaching climate and health benefits. Methane leaks alongside toxic air pollutants such as cancer-causing benzene and smog-forming volatile organic compounds, harming the nearly 18 million people that live within one mile of an oil or gas well, including disproportionately large numbers of communities of color, people living below the poverty line, older individuals, and young children.

One of the most important provisions of the Inflation Reduction Act is titled the “Methane Emissions Reduction Program,” a new section 136 of the Clean Air Act establishing an escalating pollution fee on excessive methane emissions from oil and gas activities: \$900 per ton in 2024, \$1200 in 2025, and \$1500 in 2026 and thereafter.

Key features of the program include requirements that EPA revise how it measures methane emissions using “empirical data” based on actual measurements that “accurately reflect total methane emissions.” This is essential as EDF-led peer reviewed science using infrared cameras and aerial flyovers document oil and gas methane emissions 60% higher than EPA’s outdated estimates.

This critically important addition to the Clean Air Act encourages states to quickly develop plans and gain EPA approval to implement oil and gas methane standards under section 111 of the Clean Air Act. Under the Inflation Reduction Act, compliance with these Clean Air Act regulatory requirements will allow operators to avoid paying the pollution fee. EPA’s forthcoming methane rules for oil and gas operations establish an irreducible floor — if future regulations are not as strong as those currently under development by EPA, the compliance exemption ceases to apply and operators will once again have to pay the fee. Congress, however, recognizing EPA’s proposed methane rules are only a floor, appropriated \$1.55 billion to drive deeper reductions, including \$700 million to ensure EPA addresses the methane from marginal wells that produce scant oil and gas but are disproportionately large emitters of methane. EPA is poised to issue a supplemental proposal strengthening methane pollution protections for marginal wells and other emitting activities.

The Inflation Reduction Act’s methane provisions address other key issues including end-of-life pollution from oil and gas wells. Congress requires EPA to determine “closure requirements,” and wells permanently shut-in and plugged-in accordance with those closure requirements may be exempted from the pollution fee. This reform is pivotal to ensure the owners and operators of these wells, rather than taxpayers, bear proper clean-up and closure costs.

In crafting these path-breaking protections, Congress also recognized the particular burdens of oil and gas pollution and industrial activities on local communities. The Inflation Reduction Act provides funding for “mitigating health effects of methane and other greenhouse gas emissions,

and legacy air pollution from petroleum and natural gas systems in low-income and disadvantaged communities.” EPA has discretion on how best to use the \$1.55 billion appropriated for this program to drive down pollution and protect communities, including by improving methane monitoring and emissions estimating, supporting innovative efforts to cut pollution, and protecting frontline communities by remediating pollution and improving resilience. Through a separate appropriation, Congress also provided EPA with an additional \$20 million in grants under the Clean Air Act for “monitoring emissions of methane.”

The Inflation Reduction Act’s methane provisions are historic and offer massive benefits to public health. A new [Congressional Research Service report](#), *Inflation Reduction Act Methane Emissions Charge* (August 4, 2022), examines aspects of this historic addition to the Clean Air Act in more detail.

### ***Low Emissions Electricity Program to ensure reductions in greenhouse gases are achieved***

The Inflation Reduction Act also importantly bolsters EPA’s ability to achieve reductions in emissions of greenhouse gases from power plants. New section 135 of the Clean Air Act provides EPA with \$87 million “to ensure that reductions in greenhouse gas emissions are achieved through use of existing authorities of [the Clean Air Act].” Section 135 provides that EPA’s actions to ensure additional reductions under the Clean Air Act should be based on an immediate assessment of the forecast reductions through fiscal year 2031. This provision thus requires that, in issuing standards pursuant to the Clean Air Act, EPA ensure that those standards will achieve reductions in emissions that are additional to the reductions already expected to occur from other causes, including the Inflation Reduction Act’s investments. In addition, the Low Emissions Electricity Program provides significant funding for education, technical assistance and partnerships with consumers, low-income and disadvantaged communities, industry, states, tribes and local governments to achieve reductions in greenhouse gas emissions from domestic electricity generation and use.

### ***Strengthening implementation of the American Innovation and Manufacturing Act***

The Inflation Reduction Act invests in EPA’s program under the American Innovation and Manufacturing Act of 2020 to phasedown hydrofluorocarbons and transition to next generation technologies including \$20 million to carry out the program, \$3.5 million in new implementation and compliance tools, and \$15 million in competitive grants to foster innovative technologies.

- **Transparency and accountability for corporate climate commitments**

Private-sector commitments to reduce greenhouse gases have often been met with public distrust due to a lack of transparency and accountability. In the Inflation Reduction Act, Congress provides EPA with \$5 million to support strengthened “standardization and transparency of corporate climate action commitments and plans to reduce greenhouse gases,” paired with ensuring real-world “progress toward meeting such commitments and implementing such plans.”

- **New EPA program to address the carbon embodied in construction materials used in transportation and federal building projects**

In the Inflation Reduction Act, Congress provides \$250 million for a new program of grants, technical assistance, and action to promote “steadily reducing” the greenhouse gases embodied

in the “materials or product associated with all relevant stages of production, use, and disposal” for “construction materials and products.”

This new funding is paired with a \$100 million investment for EPA to carry out a labeling program, in consultation with the Federal Highway Administration for the carbon embodied in the construction materials used in transportation projects and by the General Services Administration for federal buildings.

- **Investing in advanced biofuels and improved testing including evaluating impacts on low-income and disadvantaged communities**

To strengthen climate and health protections under the renewable fuels program in section 211(o) of the Clean Air Act, the Inflation Reduction Act provides \$10 million to EPA for new grants to industry “to support investments in advanced biofuels” and \$5 million for improved testing, data collection, analysis to modernize regulations, and evaluation of fuel lifecycle implications on the public and on low-income and disadvantaged communities.

- **Modernizing the scaffolding of the Clean Air Act: transparency, accountability, compliance and enforcement through investments in 21<sup>st</sup> century monitoring and enforcement information systems**

Air quality monitoring is the backbone of our nation’s premier clean air law. Monitoring is foundational in identifying problems and threats to the public, empowering the public, informing and driving policy action, measuring progress, and ensuring compliance and enforcement. In July, the U.S. Government Accountability Office called for modernization of the monitoring programs and systems under the Clean Air Act to address “persistent challenges in meeting additional information needs” including:

“(1) establishing priorities for air toxics monitoring; (2) developing and improving air quality monitoring methods; (3) integrating emerging technologies, such as low-cost sensors; and (4) managing and integrating additional monitoring data.”

The Inflation Reduction Act greatly bolsters federal air quality monitoring. It provides for a multi-programmatic overhaul of EPA’s monitoring under the Clean Air Act, paired with key new investments in compliance and enforcement information systems.

*Fenceline air monitoring and screening air monitoring*

The new legislation provides \$117.5 million to EPA in Clean Air Act grants to “deploy, integrate, support, and maintain fenceline air monitoring, screening air monitoring, national air toxics trend stations, and other air toxics and community monitoring.”

*Multipollutant monitoring stations*

EPA is provided \$50 million in Clean Air Act grants to “expand the national ambient air quality monitoring network with new multipollutant monitoring stations.”

*Air quality sensors in low-income and disadvantaged communities*

The new legislation provides EPA with \$3 million in Clean Air Act grants “to deploy, integrate, and operate air quality sensors in low-income and disadvantaged communities.”

*Strengthening EPA testing and activities to address emissions from wood heaters*

Congress directed \$15 million to EPA in Clean Air Act grants for “testing and other agency activities to address emissions from wood heaters.”

*Funding for enforcement technology and public information*

Congress also provides \$25 million to modernize our nation’s compliance and enforcement information systems such as the Integrated Compliance Information System and to update inspection software, directing resources to EPA as well as state, tribal and local air pollution control agency partners.

**Important action lies ahead**

This modernization of the Clean Air Act and the important investments in climate and clean energy solutions and in communities long overburdened by pollution are just the beginning — EPA, state, tribal and local governments, and all, must now begin the vital work of making Congress’ goals a reality and ensuring these new protections deliver. Important engagement and advocacy opportunities lie ahead to ensure funding is distributed effectively and equitably, and to ensure that EPA implements its updated authorities in accordance with Congress’ intent, maximizing pollution reductions and helping put us on the path to meeting our climate commitments. And while this new law is a crucial step on a path toward environmental justice and climate stability, much more will be urgently needed to address the inequitable pollution and climate burdens currently afflicting communities.

Message

---

**From:** Vickie Patton [vpatton@edf.org]  
**Sent:** 11/24/2021 3:31:47 PM  
**To:** Goffman, Joseph [Goffman.Joseph@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Charmley, William [charmley.william@epa.gov]  
**CC:** Chester France [cjfrance@sbcglobal.net]; Peter Zalzal [pzalzal@edf.org]; Alice Henderson [ahenderson@edf.org]; Jason Mathers [jmathers@edf.org]  
**Subject:** Clean Freight Trucks and Buses: Analyses of State Policy Action and National Infrastructure Investments  
**Attachments:** Truck-and-Bus-Electrification-Investments as of November 19 2021 (002).pdf

Dear EPA Officials,

Thank you for your public service – and for all you do each day to protect human health and the environment for all people and communities.

We have provided two analyses for your consideration in addressing the extensive harms of the multiple pollutants discharged from medium- and heavy-duty freight vehicles.

Both the Bipartisan Infrastructure Legislation adopted into law and the Build Back Better legislation pending before the U.S. Senate provide extensive infrastructure investments for medium- and heavy-duty vehicles as reflected in the attached summary that is also available here,

<http://blogs.edf.org/climate411/files/2021/11/Truck-and-Bus-Electrification-Investments.pdf>.

In addition, numerous states are taking concrete policy action in a variety of important ways. We have summarized some examples below.

Wishing each of you joyful holidays. Thank you, again, for your public service.

Sincerely yours,  
Vickie Patton

\*\*\*

In 2020, California adopted the world's first zero-emission truck rule, which will require manufacturers to start selling new heavy-duty ZEVs by 2024. This landmark Advanced Clean Truck (ACT) rule is expected to prevent more than 900 premature deaths, save the state economy up to \$12 billion over the next 20 years and create thousands of new jobs by 2035. Importantly, California also adopted more protective heavy-duty low NO<sub>x</sub> emissions standards to help California meet national ambient air quality standards and vital state public health and environmental justice goals.

In a major recent development Oregon became the first state outside of California to adopt both the ACT rule and the heavy-duty low-NO<sub>x</sub> rule, which will apply to model years 2025 and beyond. Oregon will see a projected \$21.2 billion in net societal benefits, including saving fleet owners over \$1 billion annually, prevent 160 premature deaths and avoid 84,000 respiratory illnesses by 2050 with the adoption of these two rules, according to an independent study by MJ Bradley & Associates. The report also found that the ACT and NO<sub>x</sub> rules would reduce truck and bus related ozone-forming NO<sub>x</sub> emissions by 93 percent, particulate matter by 83 percent, and climate pollution by 55 percent.

Five other states—Maine, Massachusetts, New Jersey, New York, and Washington—are also moving forward to adopt the Advanced Clean Trucks rule. These states, together with California and Oregon, which have also both adopted the Heavy-Duty NOx Omnibus rule, contain more than 20-percent of the national fleet of medium- and heavy-duty trucks.

On November 3, 2021, Washington Governor Jay Inslee signed an executive order that seeks to move state government to an all-electric fleet of vehicles by 2035. The order requires the 24 executive branch agencies under Inslee’s direction to replace conventional vehicles with battery electric vehicles (BEVs). For medium and heavy-duty vehicles, 30% must transition to electric by 2030 and 100% by 2040.

In New York, Governor Hochul signed a bill into law that provides that 100 percent of new medium- and heavy-duty vehicle sales be zero emitting by 2045 for all operations where feasible and new passenger and off-road sales by 2035.

Fifteen states and the District of Columbia launched a multi-state initiative to advance and accelerate the market for electric medium- and heavy-duty vehicles. The voluntary initiative set a target of 30 percent of new truck and bus sales being ZEV by 2030 and 100 percent ZEV sales by 2050 with an emphasis on the need to accelerate deployment in disadvantaged communities. The agreement could result in an estimated reduction of up to 740 million barrels of oil by 2045, which is equivalent to more than 300 million metric tons of CO<sub>2</sub> pollution.

California Governor Newsom recently signed Senate Bill 372, which directs the California Air Resources Board and the state treasurer’s office to offer a suite of financial incentives to help owners of medium- and heavy-duty trucks and buses pay for the costs of replacing their diesel-fueled fleets with cleaner, zero-emission alternatives. SB 372 also ensures that 75 percent of the state’s financial products offered as part of this legislation go to underserved communities.

Earlier this year, Colorado commissioned an independent medium- and heavy-duty vehicle study that found that aggressive zero-emission vehicle policies could deliver more than \$20 billion in benefits to Coloradans over the next 30 years. Clean truck policies would cut medium- and heavy-duty vehicle emissions by 45 percent or more by mid-century and cut smog-forming emissions by 90 percent compared to today, reducing respiratory disease, hospital admissions and premature deaths — with a social value of more than \$3 billion.

In Illinois, Governor Pritzker signed the Climate and Equitable Jobs Act into law, which, among other things sets targets for clean energy and requires the Illinois Commerce Commission to form beneficial electrification plans to facilitate clean vehicle solutions (i.e. charging station deployment), with minimum investments in pollution-burdened and eligible communities.

The New Jersey Board of Public Utilities recently issued a medium- and heavy-duty straw proposal, catalyzing a process for utility infrastructure programs. The impetus for the straw proposal was the cost and environmental benefits of electrifying the transportation sector, given that that sector is responsible for 40 percent of the state’s GHG emissions, and trucks and buses are about one-third of those transportation emissions.

The Illinois Commerce Commission is engaging in a series of workshops designed to inform guidance in advance of utility beneficial electrification plans focused on supporting vehicle electrification. Medium- and heavy-duty vehicle electrification is a significant focus of the workshops and stakeholders are dedicated to ensuring that trucks and buses are appropriately prioritized in utility programs.

California is in the process of finalizing a carefully developed draft framework that will serve as a guidebook for utilities developing infrastructure deployment programs for transportation electrification.



This e-mail and any attachments may contain confidential and privileged information. If you are not the intended recipient, please notify the sender immediately by return e-mail, delete this e-mail and destroy any copies. Any dissemination or use of this information by a person other than the intended recipient is unauthorized and may be illegal.

## Truck and Bus Electrification Investments

Congress has recently advanced two major pieces of legislation that contain significant investments to advance the electrification of trucks and buses. Combined, these pieces of legislation will help accelerate the adoption of electric trucks and buses by making the vehicles and associated infrastructure more affordable and accessible. This historic investment will also deliver local air quality benefits while decarbonizing the transportation sector – the nation’s largest source of climate pollution.

### Infrastructure Investment and Jobs Act (IIJA) – signed into law by President Biden

- **\$5 billion for Low-Carbon and Zero-Emission School Buses:** \$5 billion is allocated to help state and local governments, eligible contractors, and nonprofit school transportation associations adopt low-carbon and zero-emission school buses. \$2.5 billion is designated specifically for zero-emission buses, and another \$2.5 billion is for low-carbon emissions buses (which zero-emission buses can compete for).
- **\$7.5 billion for Electric Vehicle Charging:** \$7.5 billion is allocated to build out a national network of electric vehicle charging stations. Eligible grant applicants include state and local governments, transit authorities, and tribes. This funding includes the National Electric Vehicle Formula Program, which will provide states with \$5 billion to strategically deploy electric vehicle charging infrastructure over 5 years. An additional \$2.5 billion will go towards alternative fueling infrastructure, including electric vehicle charging, through the Highway Trust Fund.
- **\$5.25 billion for Low/No program:** \$5.25 billion is allocated for funding zero/low emission transit buses through the Low or No Emission Vehicle (“Low-No Bus”) program (this program almost always funds electric transit buses).
- **\$400 million for reduction of truck emissions at ports:** This Department of Transportation funding would establish a competitive grant program to reduce port-related emissions from idling trucks. The legislation also includes a study on how ports benefit from electrification and emerging technology to reduce truck emissions.
- **\$2.25 billion to fund the Port Infrastructure Development Program:** This Department of Transportation funding can be used to reduce or eliminate pollutants and greenhouse gas emissions at ports, as well as installing electric vehicle/alternative refueling infrastructure.
- **Expansion of the Advanced Technology Vehicles Manufacturing Program (ATVM):** The legislation expands the ATVM Program within the Department of Energy’s Loan Program Office to include medium and heavy-duty vehicles and off-road vehicles, including maritime technology.
- **\$6 billion for Battery Processing and Manufacturing:** This grant program provides funding to expand the processing and manufacturing of advanced batteries (including for electric vehicles and the electric grid) in the U.S. There are battery material processing grants that go to demonstration projects, construction of facilities and retooling/retrofitting/expanding facilities for battery manufacturing and recycling.
- **\$10 million for a lithium-ion battery recycling prize competition:** This provides funds for the Energy Secretary to provide prize money for competition winners.
- **\$60 million for Battery Recycling Research, Development, and Demonstration Grants:** The Energy Secretary, in coordination with the EPA Administrator, shall award multi-year grants to eligible entities for research, development, and demonstration projects to create innovative and practical approaches to increase the reuse and recycling of batteries.

- **\$3 billion for Deployment of Technologies to Enhance Grid Flexibility:** This includes the ability to facilitate the aggregation or integration of distributed energy resources to serve as assets for the grid; provide energy storage to meet fluctuating electricity demand, provide voltage support, and integrate intermittent generation sources, including vehicle-to-grid technologies; facilitate the integration of renewable energy resources, electric vehicle charging infrastructure, and vehicle-to-grid technologies; and reliably meet increased demand from electric vehicles and the electrification of appliances and other sectors.

### **Build Back Better Act (BBBA) – passed the House, awaiting Senate passage**

#### **Tax credits:**

- **Tax Credit for Commercial Zero-Emission Vehicles:** A new 45Y tax credit for commercial electric vehicles is established, covering up to 30% of the cost of the vehicle, or the incremental cost compared to a similar internal combustion engine vehicle.
- **Tax Credit for Alternative Fuel Vehicle Refueling Property:** The 30C Alternative Fuel Vehicle Refueling Property Credit is extended and expanded to an uncapped 20% investment tax credit after the first \$100,000 in investment (the initial \$100,000 invested receives a 30% tax credit).
- **Tax Credit for Manufacturing Investment:** The 48C Tax Credit, which reduces the cost of developing new facilities to produce clean energy technologies and vehicles, is expanded to include medium and heavy-duty zero-emission vehicles.

#### **Grant programs:**

- **\$5 billion for a Clean Heavy Duty Vehicles Program:** A new \$5 billion program at the EPA is established to electrify class 6 and 7 vehicles, with \$2 billion designated specifically for nonattainment areas. Funding can go towards the replacement of vehicles, infrastructure, and workforce development/training.
- **Nearly \$9 billion for Federal Fleet Electrification:** The bill provides nearly \$6 billion to acquire electric vehicles and support infrastructure for the United States Postal Service, and it provides nearly \$3 billion for the procurement of electric vehicles and support infrastructure for the General Services Administration.
- **\$3.5 billion to reduce air pollution at ports:** This funding can be used to purchase zero-emission port equipment and technology through the EPA.
- **\$60 million to reduce diesel emissions:** This EPA funding can be used to reduce emissions resulting from goods movement facilities, and vehicles servicing goods movement facilities, in low-income and disadvantaged communities to address the health impacts of such emissions on such communities.
- **\$10 billion for a new Affordable Housing Access Program:** A new program at HUD is established for grants that include a corridor-based bus rapid transit project that utilizes zero-emission vehicles, as well as the acquisition of zero-emission vehicles and related infrastructure.
- **\$4 billion for Neighborhood Access and Equity Grant Program:** This funding includes reducing surface transportation-related air pollution, DACs, and tech assistance.
- **\$2 billion for electric vehicle charging infrastructure:** This funding is for state, local, and nonprofit efforts to install zero-emission vehicle charging or fueling infrastructure and is part of the EPA's Greenhouse Gas Reduction Fund.
- **\$1 billion for Zero-Emission Infrastructure grants:** This funding includes \$600 million for publicly accessible Level 2 electric vehicle service equipment, \$200 million for publicly accessible networked DC fast chargers and electric vehicle charging stations, and \$200 million for hydrogen fueling stations. The funding is targeted for rural communities and underserved or disadvantaged communities.
- **\$3.5 billion for Domestic Manufacturing Conversion Grants:** Grants relating to domestic production of plug-in electric hybrid, plug-in electric drive, and hydrogen fuel cell electric vehicles.

Message

---

**From:** Chester France [cjfrance@sbcglobal.net]  
**Sent:** 9/18/2022 8:10:48 PM  
**To:** Goffman, Joseph [Goffman.Joseph@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]; Charmley, William [charmley.william@epa.gov]  
**CC:** Vickie Patton [vpattton@edf.org]; Peter Zalzal [pzalzal@edf.org]  
**Subject:** Inflation Reduction Act:  
**Attachments:** 20220909 EDF EPA IRA 2022-MDHD-Final.pdf; EDF MDHD Electrification-v1.5\_20220203.pdf

Dear EPA Officials,

I have attached a briefing prepared by Roush Advanced Engineering analyzing the key effects of the Inflation Reduction Act (IRA) on their previous report (also attached for your reference) that evaluated the cost of electrifying several important medium- and heavy-duty market segments for MY 2027-2030.

Their analysis found that the IRA's clean vehicle tax credits, refueling property credits, and the numerous manufacturing credit provisions have consequential impacts on EV purchase price, charger costs, BEV cumulative net savings, total cost of ownership (TCO), timing of TCO parity, and the cost of battery production. In all cases, the relative economics of BEVs compared to the ICE vehicle they replace is dramatically improved and the timing of purchase price and TCO parity is accelerated. Purchase price parity is reached as early as 2023 for the seven MD/HD segments Roush examined and time to reach TCO breakeven is accelerated by at least 1-2 years.

We would be happy to discuss Roush's analysis in more detail and the game-changing impact the IRA has on the deployment of zero-emitting technologies in the 2023-2029 timeframe. We are also prepared to have Roush provide a technical briefing on their analysis and findings if that would be helpful.

Best,  
Chet

Message

---

**From:** Daken, Abigail [Daken.Abigail@epa.gov]  
**Sent:** 9/20/2021 1:07:07 PM  
**To:** Alisa Petersen [apetersen@rmi.org]; Kaplan, Katharine [Kaplan.Katharine@epa.gov]  
**CC:** Bailey, Ann [Bailey.Ann@epa.gov]; Mark Kresowik [mkresowik@rmi.org]; Denise Grab [dgrab@rmi.org]; Jim Dennison [jdennison@rmi.org]; Conlin, Beth [Conlin.Beth@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]  
**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

I look forward to our discussion.

Abigail Daken  
ENERGY STAR Program | U.S. Environmental Protection Agency

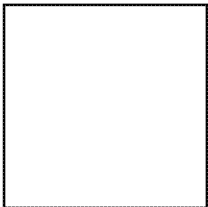
Phone: 202-343-9375 | Cell: 202-236-8848  
Street Address/Overnight Mail: 1201 Constitution Ave., NW | MC 6202A | Washington, DC 20004  
Mail: 1200 Pennsylvania Ave. NW | MC 6202A | Washington, DC 20460

---

**From:** Alisa Petersen <apetersen@rmi.org>  
**Sent:** Friday, September 17, 2021 4:54 PM  
**To:** Daken, Abigail <Daken.Abigail@epa.gov>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>  
**Cc:** Bailey, Ann <Bailey.Ann@epa.gov>; Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>  
**Subject:** Re: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

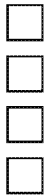
Thanks for your willingness to discuss both topics! Looking at my team's calendars it seems like 10-11 AM ET on Wednesday will work best for everyone. I'll send over a meeting invitation.

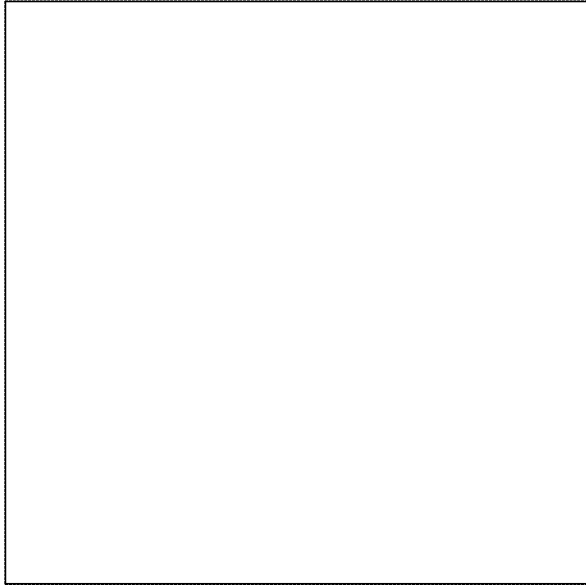
Have a lovely weekend!



Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)  
| 1850 M Street NW Suite 280 | Washington, DC





\*Why do pronouns matter?

---

**From:** Daken, Abigail <Daken.Abigail@epa.gov>

**Sent:** Thursday, September 16, 2021 5:01 PM

**To:** Alisa Petersen <apetersen@rmi.org>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>

**Cc:** Bailey, Ann <Bailey.Ann@epa.gov>; Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>

**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Hi Alisa, I'd be pleased to talk with you about this, to supplement our discussions with manufacturers and with other advocates. It looks like Katharine and I are available next M-W; if none of these work for you I can look at the following week.

Monday 9/20: 9am

Tuesday 3pm – 5pm

Wednesday 9:30 am – 11 am, 3pm – 5pm

Abigail Daken

ENERGY STAR Program | U.S. Environmental Protection Agency

Phone: 202-343-9375 | Cell: 202-236-8848

Street Address/Overnight Mail: 1201 Constitution Ave., NW | MC 6202A | Washington, DC 20004

Mail: 1200 Pennsylvania Ave. NW | MC 6202A | Washington, DC 20460

---

**From:** Bailey, Ann <Bailey.Ann@epa.gov>  
**Sent:** Thursday, September 16, 2021 12:37 PM  
**To:** Alisa Petersen <apetersen@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>  
**Cc:** Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Daken, Abigail <Daken.Abigail@epa.gov>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>  
**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Hi Alisa,

Thanks for reaching out. I can help on both counts. With respect to ENERGY STAR Most Efficient, we appreciated your comments. It is always very helpful to get comments from a range of stakeholders – not just our manufacturing partners. The final 2022 recognition criteria should be out very soon (I think we are shooting for next week). With respect to the Version 6.0 heat pump specification, we would welcome the opportunity to talk through with you whatever you are hearing from manufacturers. We are actively engaged with them as well, but if nothing else, it would be constructive for you to know how we are responding. The point person for that discussion would be Abi Daken.

Abi – can you please reach out to Alisa with some possible times? Maybe you could include Katharine, and also talk more broadly about RMI's perspective on Most Efficient.

Thanks,

Ann

---

**From:** Alisa Petersen <apetersen@rmi.org>  
**Sent:** Thursday, September 16, 2021 11:03 AM  
**To:** Conlin, Beth <Conlin.Beth@epa.gov>; Bailey, Ann <Bailey.Ann@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>  
**Cc:** Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>  
**Subject:** Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Good Morning Beth and Ann,

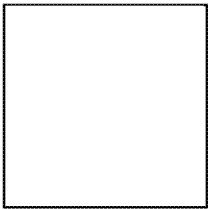
Thanks again for organizing that EPA/RMI meeting a couple months ago. It was really great to meet everyone over there and understand their priorities and how we could be supportive. I am reaching back out for a couple reasons:

1. **Most Efficient Designation:** As you're aware, we submitted comments for the proposed energy star 2022 most efficient criteria. We would love to chat with you about these comments and understand where we could be more helpful but understand if you would prefer to stick to the more formal review process. Either way, are you able to share the timing for releasing the Most Efficient designation?
2. **ENERGYSTAR 6.0 for heat pumps:** We have heard some concerns from heat pump manufacturers about how this is designed. It would be great to set up some time to discuss whether those concerns are valid and possibly support in identifying solutions. We heard Alejandra may be the right person to talk to for this conversation, so I also included her on this email.

If either or both of these conversations are of interest, please send around some times that would work for you!

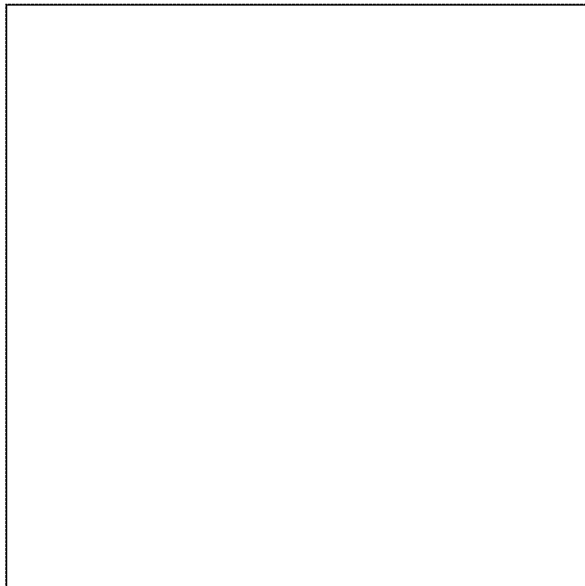
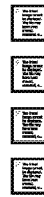
Hope you are all doing well!

Kind Regards,



Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@nmi.org](mailto:Apetersen@nmi.org)  
| 1850 M Street NW Suite 280 |  
Washington, DC



\*Why do pronouns matter?



Message

---

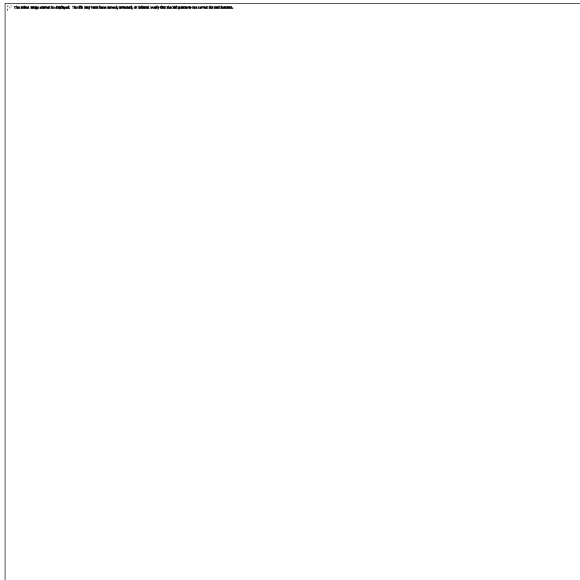
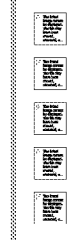
**From:** Mark Kresowik [mkresowik@rmi.org]  
**Sent:** 9/16/2021 4:57:41 PM  
**To:** Nunez, Alejandra [Nunez.Alejandra@epa.gov]  
**Subject:** Re: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Also, "hi" in our respective new jobs. Would love to catch up some time about your life, liberty, and pursuit of happiness totally independent from work now that I can talk to you again? 😊



Mark Kresowik  
Federal Policy Manager RMI  
Carbon-Free Buildings Program

✉ [mkresowik@rmi.org](mailto:mkresowik@rmi.org)  
p 319-621-7393  
@electrifyus



---

**From:** Alisa Petersen <apetersen@rmi.org>  
**Sent:** Thursday, September 16, 2021 11:03 AM  
**To:** Conlin, Beth <Conlin.Beth@epa.gov>; Bailey, Ann@epa.gov <Bailey.Ann@epa.gov>; Nunez.Alejandra@epa.gov <Al>  
**Cc:** Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>  
**Subject:** Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Good Morning Beth and Ann,

Thanks again for organizing that EPA/RMI meeting a couple months ago. It was really great to meet everyone over there and understand their priorities and how we could be supportive. I am reaching back out for a couple reasons:

1. **Most Efficient Designation:** As you're aware, we submitted comments for the proposed energy star 2022 most efficient criteria. We would love to chat with you about these comments and understand

where we could be more helpful but understand if you would prefer to stick to the more formal review process. Either way, are you able to share the timing for releasing the Most Efficient designation?

2. **ENERGYSTAR 6.0 for heat pumps:** We have heard some concerns from heat pump manufacturers about how this is designed. It would be great to set up some time to discuss whether those concerns are valid and possibly support in identifying solutions. We heard Alejandra may be the right person to talk to for this conversation, so I also included her on this email.

If either or both of these conversations are of interest, please send around some times that would work for you!

Hope you are all doing well!

Kind Regards,



Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)  
| 1850 M Street NW Suite 280 |  
Washington, DC



[\\*Why do pronouns matter?](#)

Message

---

**From:** Mark Kresowik [mkresowik@rmi.org]  
**Sent:** 10/12/2021 7:59:11 PM  
**To:** Daken, Abigail [Daken.Abigail@epa.gov]; Alisa Petersen [apetersen@rmi.org]; Kaplan, Katharine [Kaplan.Katharine@epa.gov]  
**CC:** Bailey, Ann [Bailey.Ann@epa.gov]; Denise Grab [dgrab@rmi.org]; Jim Dennison [jdennison@rmi.org]; Conlin, Beth [Conlin.Beth@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]  
**Subject:** Re: EPA/RMI Touch Base  
**Attachments:** ATT00001.txt

Thank you, we got the proposed update but I know I missed the registration opportunity, will make sure the networks know about that time tomorrow!



Mark Kresowik  
Federal Policy Manager RMI  
Carbon-Free Buildings Program

e [mkresowik@rmi.org](mailto:mkresowik@rmi.org)  
p 319-621-7393  
@electrifyus



---

**From:** Daken, Abigail <Daken.Abigail@epa.gov>  
**Sent:** Tuesday, October 12, 2021 3:57 PM  
**To:** Alisa Petersen <apetersen@rmi.org>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>  
**Cc:** Bailey, Ann <Bailey.Ann@epa.gov>; Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>  
**Subject:** RE: EPA/RMI Touch Base

Hello all, thanks again for the great call last month.

I want to make sure that you got the notification of our proposed update to the residential water heaters specification (Draft 1 Version 5.0), which addresses gas efficiency levels. I

noticed that you weren't on the registered attendees list for our webinar on Wednesday, though I know it's a topic you are interested in. I hope someone from RMI will be able to make it – your input will certainly make the conversation richer. In addition to manufacturers, we have noticed a number of gas utilities and the AGA are signed up. You can [register here](#).

Regards,  
Abi Daken

Abigail Daken  
ENERGY STAR Program | U.S. Environmental Protection Agency

Phone: 202-343-9375 | Cell: 202-236-8848  
Street Address/Overnight Mail: 1201 Constitution Ave., NW | MC 6202A | Washington, DC 20004  
Mail: 1200 Pennsylvania Ave. NW | MC 6202A | Washington, DC 20460

-----Original Appointment-----

**From:** Alisa Petersen <[apetersen@rmi.org](mailto:apetersen@rmi.org)>  
**Sent:** Friday, September 17, 2021 4:59 PM  
**To:** Alisa Petersen; Daken, Abigail; Kaplan, Katharine  
**Cc:** Bailey, Ann; Mark Kresowik; Denise Grab; Jim Dennison; Conlin, Beth; Nunez, Alejandra  
**Subject:** EPA/RMI Touch Base  
**When:** Wednesday, September 22, 2021 10:00 AM-11:00 AM (UTC-05:00) Eastern Time (US & Canada).  
**Where:**

Agenda:

- Discuss ENERGYSTAR 6.0 for Heat Pumps
- Feedback/thoughts on Most Efficient Comments

---

**From:** Alisa Petersen <[apetersen@rmi.org](mailto:apetersen@rmi.org)>  
**Sent:** Friday, September 17, 2021 8:54:17 PM  
**To:** Daken, Abigail <[Daken.Abigail@epa.gov](mailto:Daken.Abigail@epa.gov)>; Kaplan, Katharine <[Kaplan.Katharine@epa.gov](mailto:Kaplan.Katharine@epa.gov)>  
**Cc:** Bailey, Ann <[Bailey.Ann@epa.gov](mailto:Bailey.Ann@epa.gov)>; Mark Kresowik <[mkresowik@rmi.org](mailto:mkresowik@rmi.org)>; Denise Grab <[dgrab@rmi.org](mailto:dgrab@rmi.org)>; Jim Dennison <[jdennison@rmi.org](mailto:jdennison@rmi.org)>; Conlin, Beth <[Conlin.Beth@epa.gov](mailto:Conlin.Beth@epa.gov)>; Nunez, Alejandra <[Nunez.Alejandra@epa.gov](mailto:Nunez.Alejandra@epa.gov)>  
**Subject:** Re: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Thanks for your willingness to discuss both topics! Looking at my team's calendars it seems like 10-11 AM ET on Wednesday will work best for everyone. I'll send over a meeting invitation.

Have a lovely weekend!



Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)  
| 1850 M Street NW Suite 280 |  
Washington, DC



  
\*Why do pronouns matter?

---

**From:** Daken, Abigail <[Daken.Abigail@epa.gov](mailto:Daken.Abigail@epa.gov)>

**Sent:** Thursday, September 16, 2021 5:01 PM

**To:** Alisa Petersen <[apetersen@rmi.org](mailto:apetersen@rmi.org)>; Kaplan, Katharine <[Kaplan.Katharine@epa.gov](mailto:Kaplan.Katharine@epa.gov)>

**Cc:** Bailey, Ann <[Bailey.Ann@epa.gov](mailto:Bailey.Ann@epa.gov)>; Mark Kresowik <[mkresowik@rmi.org](mailto:mkresowik@rmi.org)>; Denise Grab <[dgrab@rmi.org](mailto:dgrab@rmi.org)>; Jim Dennison <[jdennison@rmi.org](mailto:jdennison@rmi.org)>; Conlin, Beth <[Conlin.Beth@epa.gov](mailto:Conlin.Beth@epa.gov)>; Nunez, Alejandra <[Nunez.Alejandra@epa.gov](mailto:Nunez.Alejandra@epa.gov)>

**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Hi Alisa, I'd be pleased to talk with you about this, to supplement our discussions with manufacturers and with other advocates. It looks like Katharine and I are available next M-W; if none of these work for you I can look at the following week.

Monday 9/20: 9am

Tuesday 3pm – 5pm

Wednesday 9:30 am – 11 am, 3pm – 5pm

Abigail Daken

ENERGY STAR Program | U.S. Environmental Protection Agency

Phone: 202-343-9375 | Cell: 202-236-8848

Street Address/Overnight Mail: 1201 Constitution Ave., NW | MC 6202A | Washington, DC 20004

Mail: 1200 Pennsylvania Ave. NW | MC 6202A | Washington, DC 20460

---

**From:** Bailey, Ann <[Bailey.Ann@epa.gov](mailto:Bailey.Ann@epa.gov)>

**Sent:** Thursday, September 16, 2021 12:37 PM

**To:** Alisa Petersen <[apetersen@rmi.org](mailto:apetersen@rmi.org)>; Conlin, Beth <[Conlin.Beth@epa.gov](mailto:Conlin.Beth@epa.gov)>; Nunez, Alejandra <[Nunez.Alejandra@epa.gov](mailto:Nunez.Alejandra@epa.gov)>

**Cc:** Mark Kresowik <[mkresowik@rmi.org](mailto:mkresowik@rmi.org)>; Denise Grab <[dgrab@rmi.org](mailto:dgrab@rmi.org)>; Jim Dennison <[jdennison@rmi.org](mailto:jdennison@rmi.org)>; Daken, Abigail <[Daken.Abigail@epa.gov](mailto:Daken.Abigail@epa.gov)>; Kaplan, Katharine <[Kaplan.Katharine@epa.gov](mailto:Kaplan.Katharine@epa.gov)>

**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Hi Alisa,

Thanks for reaching out. I can help on both counts. With respect to ENERGY STAR Most Efficient, we appreciated your comments. It is always very helpful to get comments from a range of stakeholders – not just our manufacturing partners. The final 2022 recognition criteria should be out very soon (I think we are shooting for next week). With respect to the Version 6.0 heat pump specification, we would welcome the opportunity to talk through with you whatever you are hearing from manufacturers. We are actively engaged with them as well, but if nothing else, it would be constructive for you to know how we are responding. The point person for that discussion would be Abi Daken. Abi – can you please reach out to Alisa with some possible times? Maybe you could include Katharine, and also talk more broadly about RMI's perspective on Most Efficient.

Thanks,  
Ann

---

**From:** Alisa Petersen <[apetersen@rmi.org](mailto:apetersen@rmi.org)>

**Sent:** Thursday, September 16, 2021 11:03 AM

**To:** Conlin, Beth <[Conlin.Beth@epa.gov](mailto:Conlin.Beth@epa.gov)>; Bailey, Ann <[Bailey.Ann@epa.gov](mailto:Bailey.Ann@epa.gov)>; Nunez, Alejandra <[Nunez.Alejandra@epa.gov](mailto:Nunez.Alejandra@epa.gov)>

**Cc:** Mark Kresowik <[mkresowik@rmi.org](mailto:mkresowik@rmi.org)>; Denise Grab <[dgrab@rmi.org](mailto:dgrab@rmi.org)>; Jim Dennison <[jdennison@rmi.org](mailto:jdennison@rmi.org)>

**Subject:** Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Good Morning Beth and Ann,

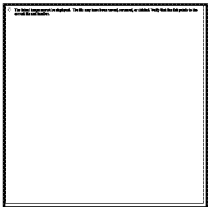
Thanks again for organizing that EPA/RMI meeting a couple months ago. It was really great to meet everyone over there and understand their priorities and how we could be supportive. I am reaching back out for a couple reasons:

1. **Most Efficient Designation:** As you're aware, we submitted comments for the proposed energy star 2022 most efficient criteria. We would love to chat with you about these comments and understand where we could be more helpful but understand if you would prefer to stick to the more formal review process. Either way, are you able to share the timing for releasing the Most Efficient designation?
2. **ENERGYSTAR 6.0 for heat pumps:** We have heard some concerns from heat pump manufacturers about how this is designed. It would be great to set up some time to discuss whether those concerns are valid and possibly support in identifying solutions. We heard Alejandra may be the right person to talk to for this conversation, so I also included her on this email.

If either or both of these conversations are of interest, please send around some times that would work for you!

Hope you are all doing well!

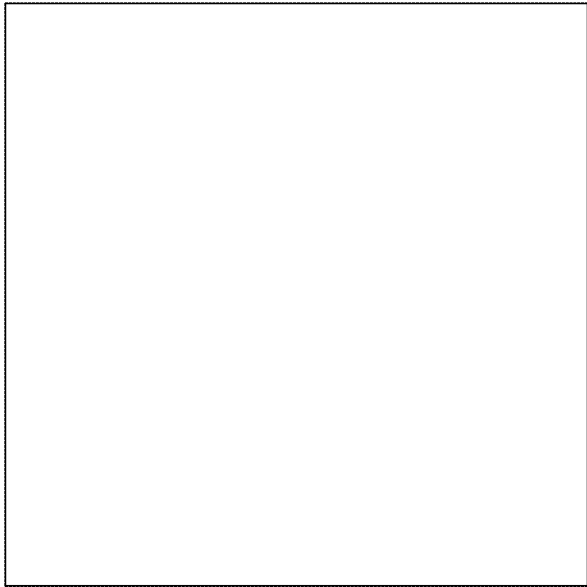
Kind Regards,



Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)  
| 1850 M Street NW Suite 280 |  
Washington, DC





[\\*Why do pronouns matter?](#)

---

## Microsoft Teams meeting

**Join on your computer or mobile app**

[Click here to join the meeting](#)

**Or call in (audio only)**

[+1 719-569-4888,,804046967#](#) United States, Pueblo

Phone Conference ID: 804 046 967#

[Find a local number](#) | [Reset PIN](#)

[Learn More](#) | [Meeting options](#)

---

## Appointment

---

**From:** Alisa Petersen [apetersen@rmi.org]  
**Sent:** 9/17/2021 8:56:46 PM  
**To:** Daken, Abigail [Daken.Abigail@epa.gov]; Kaplan, Katharine [Kaplan.Katharine@epa.gov]  
**CC:** Bailey, Ann [Bailey.Ann@epa.gov]; Mark Kresowik [mkresowik@rmi.org]; Denise Grab [dgrab@rmi.org]; Jim Dennison [jdennison@rmi.org]; Conlin, Beth [Conlin.Beth@epa.gov]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]

**Subject:** EPA/RMI Touch Base  
**Attachments:** image003.jpg; ATT00001.txt; image002.jpg

**Start:** 9/22/2021 2:00:00 PM  
**End:** 9/22/2021 3:00:00 PM  
**Show Time As:** Tentative

**Recurrence:** (none)

### Agenda:

- Discuss ENERGYSTAR 6.0 for Heat Pumps
- Feedback/thoughts on Most Efficient Comments

---

**From:** Alisa Petersen <apetersen@rmi.org>  
**Sent:** Friday, September 17, 2021 8:54:17 PM  
**To:** Daken, Abigail <Daken.Abigail@epa.gov>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>  
**Cc:** Bailey, Ann <Bailey.Ann@epa.gov>; Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>  
**Subject:** Re: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

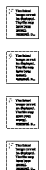
Thanks for your willingness to discuss both topics! Looking at my team's calendars it seems like 10-11 AM ET on Wednesday will work best for everyone. I'll send over a meeting invitation.

Have a lovely weekend!

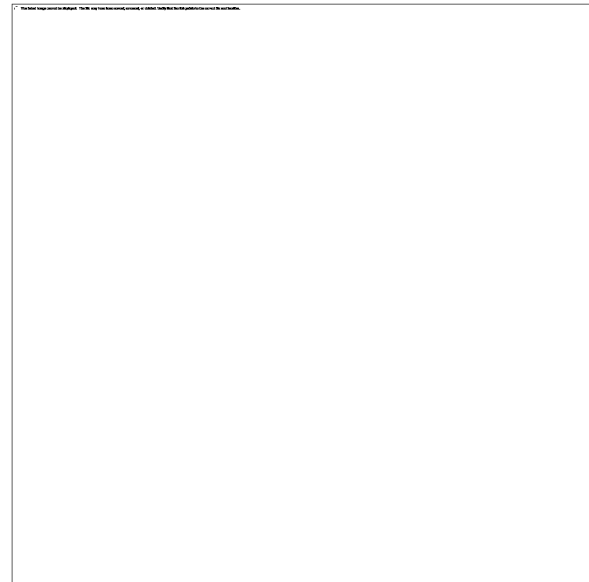


Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)  
| 1850 M Street NW Suite 280 | Washington, DC







\*Why do pronouns matter?

---

**From:** Daken, Abigail <Daken.Abigail@epa.gov>

**Sent:** Thursday, September 16, 2021 5:01 PM

**To:** Alisa Petersen <apetersen@rmi.org>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>

**Cc:** Bailey, Ann <Bailey.Ann@epa.gov>; Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>

**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Hi Alisa, I'd be pleased to talk with you about this, to supplement our discussions with manufacturers and with other advocates. It looks like Katharine and I are available next M-W; if none of these work for you I can look at the following week.

Monday 9/20: 9am

Tuesday 3pm – 5pm

Wednesday 9:30 am – 11 am, 3pm – 5pm

Abigail Daken

ENERGY STAR Program | U.S. Environmental Protection Agency

Phone: 202-343-9375 | Cell: 202-236-8848

Street Address/Overnight Mail: 1201 Constitution Ave., NW | MC 6202A | Washington, DC 20004

Mail: 1200 Pennsylvania Ave. NW | MC 6202A | Washington, DC 20460

---

**From:** Bailey, Ann <Bailey.Ann@epa.gov>

**Sent:** Thursday, September 16, 2021 12:37 PM

**To:** Alisa Petersen <apetersen@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>

**Cc:** Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Daken, Abigail <Daken.Abigail@epa.gov>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>

**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Hi Alisa,

Thanks for reaching out. I can help on both counts. With respect to ENERGY STAR Most Efficient, we appreciated your comments. It is always very helpful to get comments from a range of stakeholders – not just our manufacturing partners. The final 2022 recognition criteria should be out very soon (I think we are shooting for next week). With respect to the Version 6.0 heat pump specification, we would welcome the opportunity to talk through with you whatever you are hearing from manufacturers. We are actively engaged with them as well, but if nothing else, it would be constructive for you to know how we are responding. The point person for that discussion would be Abi Daken. Abi – can you please reach out to Alisa with some possible times? Maybe you could include Katharine, and also talk more broadly about RMI's perspective on Most Efficient.

Thanks,  
Ann

---

**From:** Alisa Petersen <[apetersen@rmi.org](mailto:apetersen@rmi.org)>

**Sent:** Thursday, September 16, 2021 11:03 AM

**To:** Conlin, Beth <[Conlin.Beth@epa.gov](mailto:Conlin.Beth@epa.gov)>; Bailey, Ann <[Bailey.Ann@epa.gov](mailto:Bailey.Ann@epa.gov)>; Nunez, Alejandra <[Nunez.Alejandra@epa.gov](mailto:Nunez.Alejandra@epa.gov)>

**Cc:** Mark Kresowik <[mkresowik@rmi.org](mailto:mkresowik@rmi.org)>; Denise Grab <[dgrab@rmi.org](mailto:dgrab@rmi.org)>; Jim Dennison <[jdennison@rmi.org](mailto:jdennison@rmi.org)>

**Subject:** Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Good Morning Beth and Ann,

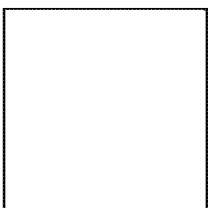
Thanks again for organizing that EPA/RMI meeting a couple months ago. It was really great to meet everyone over there and understand their priorities and how we could be supportive. I am reaching back out for a couple reasons:

1. **Most Efficient Designation:** As you're aware, we submitted [comments for the proposed energy star 2022 most efficient criteria](#). We would love to chat with you about these comments and understand where we could be more helpful but understand if you would prefer to stick to the more formal review process. Either way, are you able to share the timing for releasing the Most Efficient designation?
2. **ENERGYSTAR 6.0 for heat pumps:** We have heard some concerns from heat pump manufacturers about how this is designed. It would be great to set up some time to discuss whether those concerns are valid and possibly support in identifying solutions. We heard Alejandra may be the right person to talk to for this conversation, so I also included her on this email.

If either or both of these conversations are of interest, please send around some times that would work for you!

Hope you are all doing well!

Kind Regards,



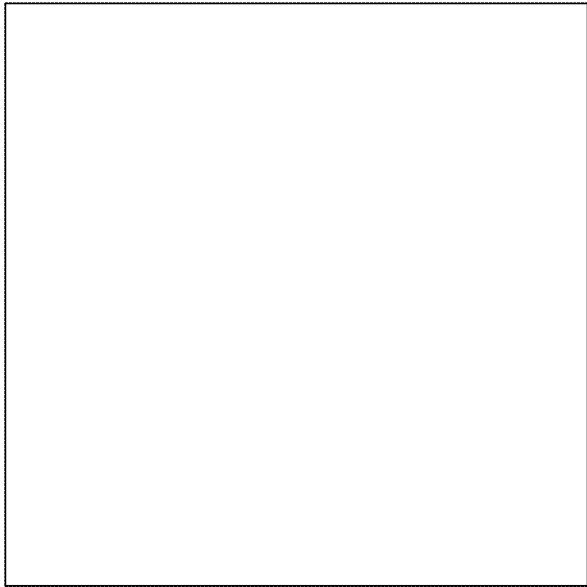
Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709

e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)

| 1850 M Street NW Suite 280 | Washington, DC





[\\*Why do pronouns matter?](#)

---

## Microsoft Teams meeting

### **Join on your computer or mobile app**

[Click here to join the meeting](#)

### **Or call in (audio only)**

[+1 719-569-4888,,804046967#](#) United States, Pueblo

Phone Conference ID: 804 046 967#

[Find a local number](#) | [Reset PIN](#)

[Learn More](#) | [Meeting options](#)

---

Message

---

**From:** Conlin, Beth [Conlin.Beth@epa.gov]  
**Sent:** 9/18/2021 10:21:16 PM  
**To:** Alisa Petersen [apetersen@rmi.org]; Daken, Abigail [Daken.Abigail@epa.gov]; Kaplan, Katharine [Kaplan.Katharine@epa.gov]  
**CC:** Bailey, Ann [Bailey.Ann@epa.gov]; Mark Kresowik [mkresowik@rmi.org]; Denise Grab [dgrab@rmi.org]; Jim Dennison [jdennison@rmi.org]; Nunez, Alejandra [Nunez.Alejandra@epa.gov]  
**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

I can't make this time, but I don't think I'm needed for this meeting. Please let me know if you need any help with follow-ups.

Regards,

Beth

---

**From:** Alisa Petersen <apetersen@rmi.org>  
**Sent:** Friday, September 17, 2021 4:54 PM  
**To:** Daken, Abigail <Daken.Abigail@epa.gov>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>  
**Cc:** Bailey, Ann <Bailey.Ann@epa.gov>; Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>  
**Subject:** Re: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Thanks for your willingness to discuss both topics! Looking at my team's calendars it seems like 10-11 AM ET on Wednesday will work best for everyone. I'll send over a meeting invitation.

Have a lovely weekend!



Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)  
| 1850 M Street NW Suite 280 | Washington, DC



\*Why do pronouns matter?

---

**From:** Daken, Abigail <[Daken.Abigail@epa.gov](mailto:Daken.Abigail@epa.gov)>  
**Sent:** Thursday, September 16, 2021 5:01 PM  
**To:** Alisa Petersen <[apetersen@rmi.org](mailto:apetersen@rmi.org)>; Kaplan, Katharine <[Kaplan.Katharine@epa.gov](mailto:Kaplan.Katharine@epa.gov)>  
**Cc:** Bailey, Ann <[Bailey.Ann@epa.gov](mailto:Bailey.Ann@epa.gov)>; Mark Kresowik <[mkresowik@rmi.org](mailto:mkresowik@rmi.org)>; Denise Grab <[dgrab@rmi.org](mailto:dgrab@rmi.org)>; Jim Dennison <[jdennison@rmi.org](mailto:jdennison@rmi.org)>; Conlin, Beth <[Conlin.Beth@epa.gov](mailto:Conlin.Beth@epa.gov)>; Nunez, Alejandra <[Nunez.Alejandra@epa.gov](mailto:Nunez.Alejandra@epa.gov)>  
**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Hi Alisa, I'd be pleased to talk with you about this, to supplement our discussions with manufacturers and with other advocates. It looks like Katharine and I are available next M-W; if none of these work for you I can look at the following week.

Monday 9/20: 9am

Tuesday 3pm – 5pm

Wednesday 9:30 am – 11 am, 3pm – 5pm

Abigail Daken  
ENERGY STAR Program | U.S. Environmental Protection Agency

Phone: 202-343-9375 | Cell: 202-236-8848  
Street Address/Overnight Mail: 1201 Constitution Ave., NW | MC 6202A | Washington, DC 20004  
Mail: 1200 Pennsylvania Ave. NW | MC 6202A | Washington, DC 20460

---

**From:** Bailey, Ann <Bailey.Ann@epa.gov>  
**Sent:** Thursday, September 16, 2021 12:37 PM  
**To:** Alisa Petersen <apetersen@rmi.org>; Conlin, Beth <Conlin.Beth@epa.gov>; Nunez, Alejandra <Nunez.Alejandra@epa.gov>  
**Cc:** Mark Kresowik <mkresowik@rmi.org>; Denise Grab <dgrab@rmi.org>; Jim Dennison <jdennison@rmi.org>; Daken, Abigail <Daken.Abigail@epa.gov>; Kaplan, Katharine <Kaplan.Katharine@epa.gov>  
**Subject:** RE: Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Hi Alisa,

Thanks for reaching out. I can help on both counts. With respect to ENERGY STAR Most Efficient, we appreciated your comments. It is always very helpful to get comments from a range of stakeholders – not just our manufacturing partners. The final 2022 recognition criteria should be out very soon (I think we are shooting for next week). With respect to the Version 6.0 heat pump specification, we would welcome the opportunity to talk through with you whatever you are hearing from manufacturers. We are actively engaged with them as well, but if nothing else, it would be constructive for you to know how we are responding. The point person for that discussion would be Abi Daken.

Abi – can you please reach out to Alisa with some possible times? Maybe you could include Katharine, and also talk more broadly about RMI's perspective on Most Efficient.

Thanks,

Ann

---

**From:** Alisa Petersen <[apetersen@rmi.org](mailto:apetersen@rmi.org)>

**Sent:** Thursday, September 16, 2021 11:03 AM

**To:** Conlin, Beth <[Conlin.Beth@epa.gov](mailto:Conlin.Beth@epa.gov)>; Bailey, Ann <[Bailey.Ann@epa.gov](mailto:Bailey.Ann@epa.gov)>; Nunez, Alejandra <[Nunez.Alejandra@epa.gov](mailto:Nunez.Alejandra@epa.gov)>

**Cc:** Mark Kresowik <[mkresowik@rmi.org](mailto:mkresowik@rmi.org)>; Denise Grab <[dgrab@rmi.org](mailto:dgrab@rmi.org)>; Jim Dennison <[jdennison@rmi.org](mailto:jdennison@rmi.org)>

**Subject:** Feedback on RMI's Comments for Proposed Energy Star 2022 Most Efficient Criteria

Good Morning Beth and Ann,

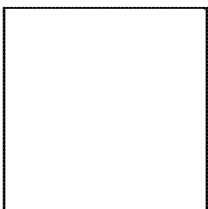
Thanks again for organizing that EPA/RMI meeting a couple months ago. It was really great to meet everyone over there and understand their priorities and how we could be supportive. I am reaching back out for a couple reasons:

1. **Most Efficient Designation:** As you're aware, we submitted comments for the proposed energy star 2022 most efficient criteria. We would love to chat with you about these comments and understand where we could be more helpful but understand if you would prefer to stick to the more formal review process. Either way, are you able to share the timing for releasing the Most Efficient designation?
2. **ENERGYSTAR 6.0 for heat pumps:** We have heard some concerns from heat pump manufacturers about how this is designed. It would be great to set up some time to discuss whether those concerns are valid and possibly support in identifying solutions. We heard Alejandra may be the right person to talk to for this conversation, so I also included her on this email.

If either or both of these conversations are of interest, please send around some times that would work for you!

Hope you are all doing well!

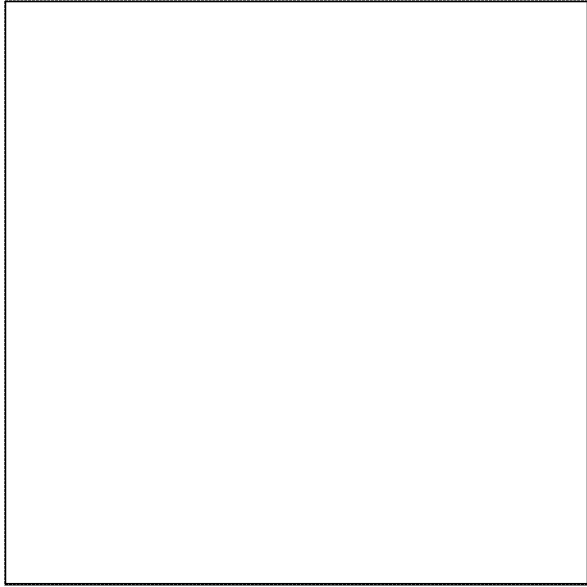
Kind Regards,



Alisa Petersen (She/Her)\*  
Federal Policy Manager  
US Program

p 952-220-1709  
e [Apetersen@rmi.org](mailto:Apetersen@rmi.org)  
| 1850 M Street NW Suite 280 |  
Washington, DC





\*Why do pronouns matter?

Message

---

**From:** Nunez, Alejandra [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=DD5DF506145D4AA19A753219FB7A7A2E-NUNEZ, ALEJ]  
**Sent:** 9/13/2021 6:05:10 AM  
**To:** 'Lienke, Jack' [lienkej@mercury.law.nyu.edu]; 'Horowitz, Cara' [HOROWITZ@law.ucla.edu]; 'Vickie Patton' [vpatton@edf.org]; 'Poloncarz, Kevin' [KPoloncarz@cov.com]; 'jack.lienke@nyu.edu' [jack.lienke@nyu.edu]  
**CC:** DeLuca, Isabel [DeLuca.Isabel@epa.gov]; 'Morphew, Heather' [morphew@law.ucla.edu]  
**Subject:** RE: Yosemite panel - materials due this Friday Sept 10  
**Attachments:** A Nunez - Yosemite Law Conference 2021.pdf

Thank you all for your patience. Attached are the slides that I plan to send to Camren first thing Monday. Please let me know if you have any questions.

---

**From:** Nunez, Alejandra  
**Sent:** Friday, September 10, 2021 12:50 PM  
**To:** Lienke, Jack <lienkej@mercury.law.nyu.edu>; Horowitz, Cara <HOROWITZ@law.ucla.edu>; Vickie Patton <vpatton@edf.org>; Poloncarz, Kevin <KPoloncarz@cov.com>; jack.lienke@nyu.edu  
**Cc:** DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Morphew, Heather <morphew@law.ucla.edu>  
**Subject:** RE: Yosemite panel - materials due this Friday Sept 10

I will do so. Thank you all for your patience. I will circle back soon.

---

**From:** Lienke, Jack <lienkej@mercury.law.nyu.edu>  
**Sent:** Thursday, September 9, 2021 11:09 AM  
**To:** Horowitz, Cara <HOROWITZ@law.ucla.edu>; Vickie Patton <vpatton@edf.org>; Poloncarz, Kevin <KPoloncarz@cov.com>; jack.lienke@nyu.edu; Nunez, Alejandra <Nunez.Alejandra@epa.gov>  
**Cc:** DeLuca, Isabel <DeLuca.Isabel@epa.gov>; Morphew, Heather <morphew@law.ucla.edu>  
**Subject:** Re: Yosemite panel - materials due this Friday Sept 10

Thanks, Cara! Ale, are you still planning put together a small set of slides to accompany your remarks (we just need 5)? If not, I can compile a set tomorrow with background information on some of the rulemakings that are likely to come up in the discussion.

All best,  
Jack

---

**From:** "Horowitz, Cara" <HOROWITZ@law.ucla.edu>  
**Date:** Wednesday, September 8, 2021 at 8:13 PM  
**To:** Vickie Patton <vpatton@edf.org>, "Poloncarz, Kevin" <KPoloncarz@cov.com>, "jack.lienke@nyu.edu" <jack.lienke@nyu.edu>, "nunez.alejandra@epa.gov" <nunez.alejandra@epa.gov>  
**Cc:** "deluca.isabel@epa.gov" <deluca.isabel@epa.gov>, "Morphew, Heather" <morphew@law.ucla.edu>  
**Subject:** Yosemite panel - materials due this Friday Sept 10

Dear all: I hope you had a good long weekend. Just a reminder that your Yosemite materials (speaker release; bio and headshot; and PPT slides) are due to CLA this Friday, Sept. 10. I'm attaching the info here again and below.

And FYI my assistant Heather is working to settle our 2-hour time block for recording the session – hope to have that nailed down this week.

Many thanks!  
Cara



---

**From:** Horowitz, Cara <[HOROWITZ@law.ucla.edu](mailto:HOROWITZ@law.ucla.edu)>  
**Sent:** Tuesday, August 24, 2021 12:13 PM  
**To:** Vickie Patton <[vpattton@edf.org](mailto:vpattton@edf.org)>; Poloncarz, Kevin <[KPoloncarz@cov.com](mailto:KPoloncarz@cov.com)>; [jack.lienke@nyu.edu](mailto:jack.lienke@nyu.edu);  
[nunez.alejandra@epa.gov](mailto:nunez.alejandra@epa.gov)  
**Cc:** [deluca.isabel@epa.gov](mailto:deluca.isabel@epa.gov); Morphew, Heather <[morphew@law.ucla.edu](mailto:morphew@law.ucla.edu)>  
**Subject:** Yosemite recording time - poll

Dear all: Great talking with you this morning. I'm looking forward to a fascinating panel.

As promised, here's a [When2Meet poll](#) we can use for selecting your preferred time for recording the 75-minute segment of your panel. It includes dates from Sept 20-Oct 1. The conference organizers instruct you to save two hours for the recording process, so please select times when you are available for a two-hour chunk.

Heather, can you monitor responses and let this group know once we have a preferred date and time? Once again I'm not necessary for this, so if there's a time that works for everyone but me, that's totally fine.

In addition:

1. Please share ideas for questions for the moderated discussion portion of the conversation with this group, so Jack can compile and recirculate a proposal for a slate of questions.
2. Please mark your calendars for the live Q&A segment of the panel, which will run from **October 14 @ 10:25-10:45 AM (Pacific time)** (and I note the open question about Ale joining for this portion)
3. Please see below for a reminder of what info is due to the conference organizers by Sept. 10, including MCLE materials (so: Ale, if you can let us know by no later than next week if you're planning to put together slides, that would be great--otherwise it sounds like Jack can create something to satisfy the requirement)

In the meantime, I have also asked for more detail on how the Q&A will run, to confirm that Jack can screen questions and direct them to appropriate answerers.

Let me know if you have other questions or if there's anything else I can help with. Thank you!!

Cara Horowitz

Andrew Sabin Family Foundation Co-Executive Director

Emmett Institute on Climate Change and the Environment

UCLA School of Law

---

**From:** Camren Butler <[camren.butler@calawyers.org](mailto:camren.butler@calawyers.org)>  
**Sent:** Tuesday, August 17, 2021 8:26 PM

**To:** jack.lienke@nyu.edu <jack.lienke@nyu.edu>; vpatton@edf.org <vpattton@edf.org>; kpoloncarz@cov.com <kpoloncarz@cov.com>; nunez.alejandra@epa.gov <nunez.alejandra@epa.gov>

**Cc:** Horowitz, Cara <horowitz@law.ucla.edu>; Peter, Ellen M. @ARB <ellen.peter@arb.ca.gov>; deluca.isabel@epa.gov <deluca.isabel@epa.gov>

**Subject:** Environmental Law Conference at Yosemite— Speaker Confirmation Letter

Dear Jack, Vicki, Kevin and Alejandra,

Thank you for agreeing to be a speaker at the California Lawyers Association (CLA) Environmental Law Section 2021 Yosemite Virtual Conference, Thursday, October 14 through Sunday, October 17. We very much appreciate your expertise and the generosity of your time.

We have selected a virtual platform to provide our attendees with an engaging and interactive experience. We will be pre-recording most panels via Zoom in advance of the Virtual Conference and are asking speakers to be available for live Q&A the last 15 minutes of their panel's presentation time. Below is your panel information including the date and time your pre-recorded panel will be shown during the Yosemite Conference. Please note that the deadline to submit all program materials, speaker biographies and headshots, and CLE speaker release forms (attached) is **Friday, September 10, 2021**.

#### **PANEL PRE-RECORDING**

Recordings will take place September 10–October 1, Monday-Friday between 9:00 a.m. and 5:00 p.m. **Please coordinate with the rest of your panel, and have the moderator (or other designated person) select the desired date and time** for your recording from the below doodle poll link. You may want to use a scheduling tool, such as When2Meet, internally to narrow down which times work best for your panel. Recordings must be done with all speakers together, and all must agree to the time and date selected.

Panels will be 90 minutes long (75 minutes for the main panel discussion + 15 minutes for Live Q&A). Please allow 2 hours for recording. A CLA staff member will reach out once your date/time is scheduled with a calendar invitation, tips for using Zoom, and a Zoom link. A staff member will also provide technical Zoom support for the recording.

*Link to sign up for a recording date and time:*

[https://doodle.com/poll/rnpbw5fxpkdiagq?utm\\_source=poll&utm\\_medium=link](https://doodle.com/poll/rnpbw5fxpkdiagq?utm_source=poll&utm_medium=link)

#### **LIVE Q&A**

Although your panel will be pre-recorded, the Q&A will be live, so we ask you to be available for the final 20 minutes of the panel presentation time (when the recording will be shown, see below).

#### **PANEL INFORMATION –**

Title: The Biden Administration – A Breath of Fresh Air?

Presentation date and time: Thursday, October 14, 2021 @ 9:15-10:45 AM

Moderator:

Jack Lienke, Regulatory Policy Director, Institute for Policy Integrity, NYU School of Law (New York, NY)

Panelists:

Vicki Patton, General Counsel, Environmental Defense Fund (Boulder, CO)

Kevin Poloncarz, Partner, Covington & Burling (San Francisco, CA)

Alejandra Nunez, Deputy Assistant Administrator for Mobile Sources, Office of Air and Radiation, U.S. Environmental Protection Agency

#### **SPEAKER BIO / PROGRAM MATERIALS / CLE SPEAKER RELEASE FORM (Deadline: Friday, September 10)**

- **Bio and headshot** — Please submit a brief bio (half page maximum) and a headshot.
- **Written materials** — Written materials are required for all panels offering MCLE credit. Please coordinate with the rest of your panel to decide what to include in written materials, consulting the guidelines below. Original writings are preferred. Written materials should be formatted as Word or PowerPoint documents only. We cannot accept scanned documents or PDF's, nor can we include copyrighted materials (unless accompanied by a signed release).

The panel slide presentation may be included in the written materials. Please use the attached *PowerPoint template* for your slide presentation.

- **CLE speaker release form** — Each speaker must submit a completed CLE speaker release form. A blank version of this form is attached.

**Please coordinate with one another to submit these items to Section Manager Camren Butler**

**([Camren.Bulter@calawyers.org](mailto:Camren.Bulter@calawyers.org)) by September 10.** Note that our server may bounce back email attachments exceeding 7 MB in size, so we suggest sending with a return receipt requested.

#### **GUIDELINES FOR WRITTEN MATERIALS**

<b>DO</b>	<b>DON'T</b>
<b>DO</b> have the panel moderator coordinate the development and submission of written materials among all panelists.	<b>DON'T</b> leave each panelist to develop and submit written materials independently.
<b>DO</b> submit written materials in Word or PowerPoint format. ( <i>For presentation slides, please use the Conference PowerPoint template.</i> )	<b>DON'T</b> submit written materials in PDF or other formats.
<b>DO</b> submit original content concerning recent current developments relating to the panel topic.	<b>DON'T</b> submit materials from another source, including newspaper articles, articles published in another place, or materials from LexisNexis, WestLaw, or a similar source.
<b>DO</b> submit substantive materials totaling 5 or more pages in length (excluding cover pages and speaker biographies) for the panel.	<b>DON'T</b> submit substantive materials of less than 5 pages in length for the panel, or fail to submit materials at all.
<b>DO</b> , if appropriate, include a reference list of web page links.	<b>DON'T</b> include copies of web pages or documents/forms found on the Internet, even when they are freely accessible to the public. These are not considered "original works." Instead create a reference list with links.
<b>DO</b> , if appropriate, include a reference list of cases, statutes, articles, etc.	<b>DON'T</b> include copies of actual cases, statutes, articles, etc. Instead create a reference list.
<b>DO</b> limit your use of photos and images in your written materials to what is necessary to present the content of your program.	<b>DON'T</b> include graphics or images that function as design elements or are otherwise not essential to convey the content of your program.

Once again, thank you for joining us as a speaker at the CLA Environmental Law Section 2021 Yosemite Virtual Conference. If you have any questions, please contact [Camren.Bulter@calawyers.org](mailto:Camren.Bulter@calawyers.org).

Thank you,

*Camren*

--

**Camren Butler | Section Manager**

California Lawyers Association

400 Capitol Mall, Suite 650 | Sacramento, CA 95814

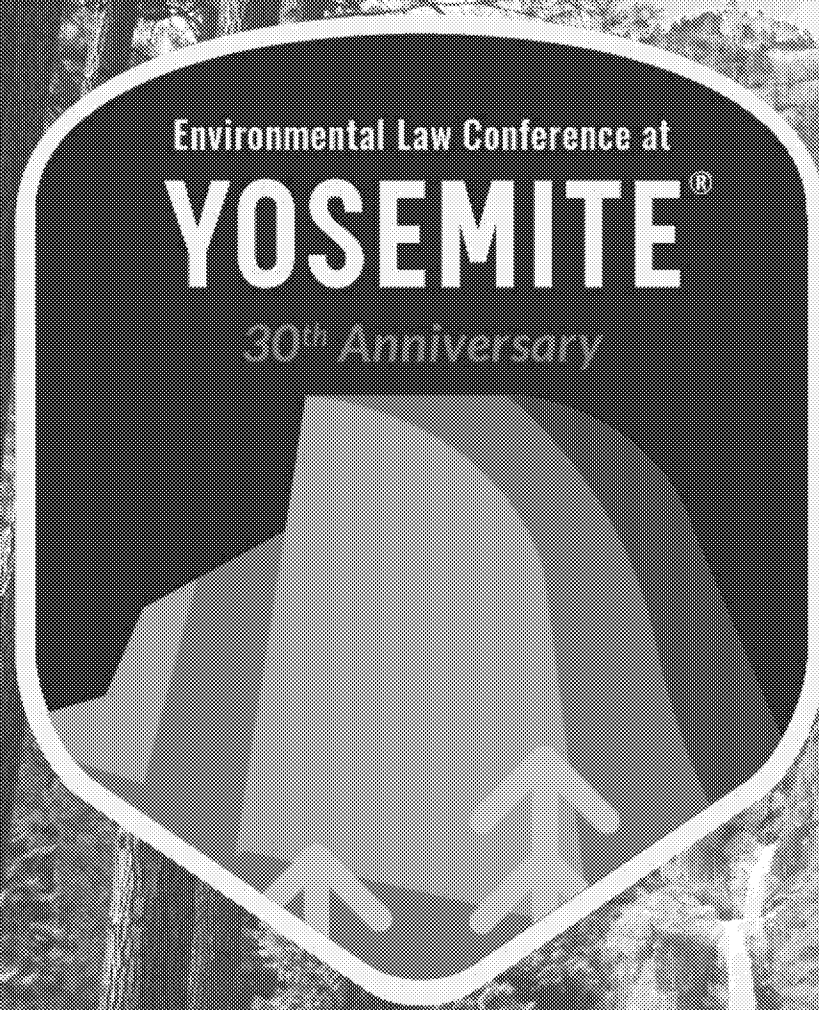
O: 916.516.1722 | [camren.butler@calawyers.org](mailto:camren.butler@calawyers.org)

Pronouns: he/him



**Please note: I will be out of office August 19-23, 2021 with limited access to email and will respond as soon as I'm able.**

This e-mail and any attachments may contain confidential and privileged information. If you are not the intended recipient, please notify the sender immediately by return e-mail, delete this e-mail and destroy any copies. Any dissemination or use of this information by a person other than the intended recipient is unauthorized and may be illegal.



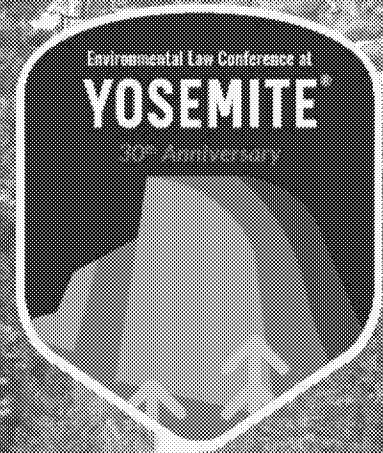
# The Biden Administration – A Breath of Fresh Air?

*Thursday, October 14, 2021*

*Alejandra Nunez, Deputy  
Assistant Administrator for  
Mobile Sources, U.S. EPA*

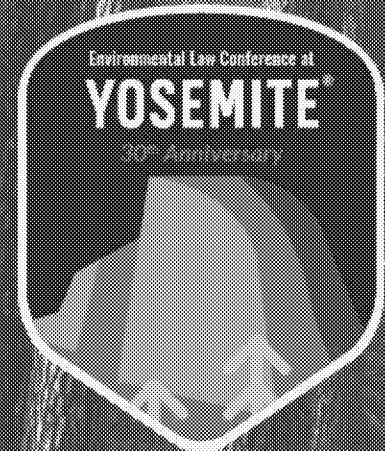
# Biden Administration's Priorities

- *Executive Orders 13390, 14037, and 14008 direct this administration to protect public health, address the climate crisis, and promote environmental justice*
- *EO 13990 requires EPA to review the actions of the prior administration to assess whether they are consistent with these priorities*
- *EO 14008 established the White House Environmental Justice Advisory Council, the White House Environmental Justice Interagency Council, and the Justice40 Initiative*
- *EO 14008 directs EPA to issue new emission standards for light- and heavy-duty vehicles*



# Addressing climate change and integrating environmental justice

- *Emphasis on climate science is back at EPA*
- *Attention to how our policies and programs affect pollution and health at the community level*
- *Multi-pollutant approaches*
- *Whole-of government enterprise (regulations, research, and investments)*
- *Stakeholder engagement*



# Climate science: indicators

- EPA partners with more than 50 data contributors to compile a key set of indicators on causes and effects of climate change
- Evidence that climate change is occurring now
- Routine tracking of observed changes and latest data
- Climate change indicators provide important input to the National Climate Assessment and other efforts

## Discover Climate Change Indicators

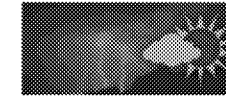
### Greenhouse Gases



#### Greenhouse Gases Summary

- U.S. Greenhouse Gas Emissions
- Global Greenhouse Gas Emissions
- Atmospheric Concentrations of Greenhouse Gases
- Climate Models

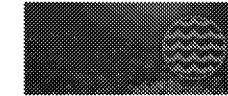
### Weather and Climate



#### Weather and Climate Summary

- U.S. and Global Temperatures
- Seasonal Temperatures
- High and Low Temperatures
- Heat Waves
- U.S. and Global Precipitation
- Heavy Precipitation
- Tornado/Storm Activity
- Heat Drought
- Drought
- A Climate Link: Temperature and Drought in the Southwest

### Oceans



#### Oceans Summary

- Ocean Heat
- Sea Surface Temperature
- Sea Level
- A Closer Look: Land Loss Along the Atlantic Coast
- Coastal Flooding
- Ocean Acidity

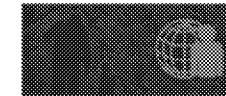
### Snow and Ice



#### Snow and Ice Summary

- Arctic Sea Ice
- Antarctic Sea Ice
- Ice Sheets
- Glaciers
- A Closer Look: The Melting of Glacier National Park
- Lakes
- Great Lakes Ice Cover
- Consecutive Consecutive Ice Breakup in Eastern Alaska Rivers
- Snowfall
- Snow Cover
- Snowpack
- Drought
- Frozen Water Conditions

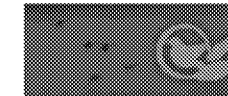
### Health and Society



#### Health and Society Summary

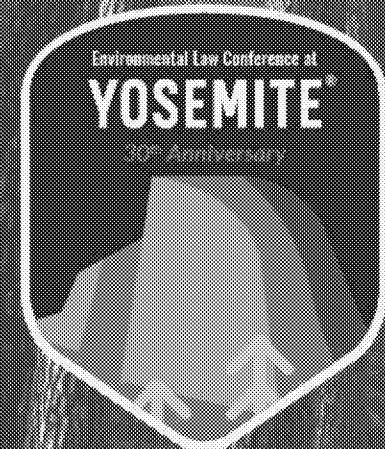
- Climate Connection: Climate Change and Human Health
- Heat-Related Deaths
- Heat-Related Illnesses
- Cold-Related Deaths
- Heat and Cooling System Stress
- Power Grid Energy Use
- Vector Borne
- West Nile Virus
- Length of Growing Season
- Growing Degree Days
- Increased Pollen Season

### Ecosystems



#### Ecosystems Summary

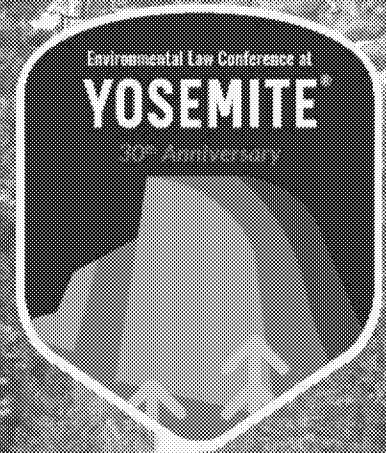
- Wetlands
- Seagrass
- Seagrass Temperature
- Tidal Connection: Trends in Known Temperature in the San Francisco Bay
- Lake Temperature
- Great Lakes Water Levels and Temperature
- First Winter on Record
- A Closer Look: The Black Death in the West
- Marine Species Distribution
- Leaf and Branch Loss
- Consecutive Consecutive Cherry Blossom Bloom Dates in Washington D.C.





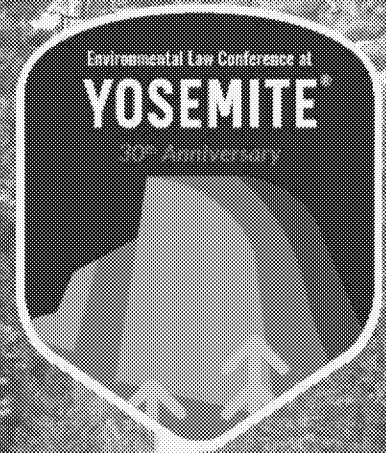
# Environmental justice: science and analysis

- Climate Change Impacts and Risk Analysis (CIRA): 2021 Social Vulnerability Report
  - This report improves our understanding of the degree to which four socially vulnerable populations—defined based on income, educational attainment, race and ethnicity, and age—may be more exposed to the most critical impacts of climate change
- Power Plants and Neighboring Communities Map
  - This mapping tool combines power plant data with demographic data from EJSCREEN (proximity analysis)



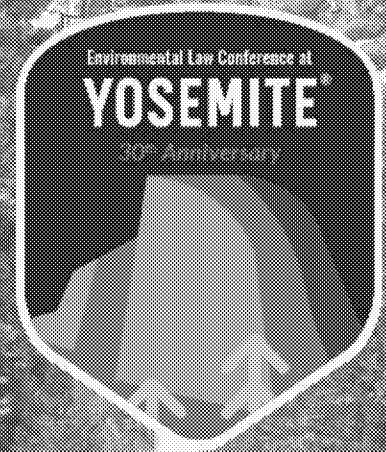
# Regulations: vehicles

- Reconsideration of EPA's withdrawal of California's waiver for GHG emission standards and ZEV mandate
- Proposed LDV GHG emission standards for MY 2023-2026
- Long-term LDV multipollutant standards post-MY 2027
- Clean Trucks Plan
  - New Low NOx standards for HD vehicles and targeted updates to Phase 2 GHG emission standards (MY 2027)
  - New GHG emission standards for all HD vehicles (MY 2030)
- NHTSA's CAFE and fuel efficiency standards



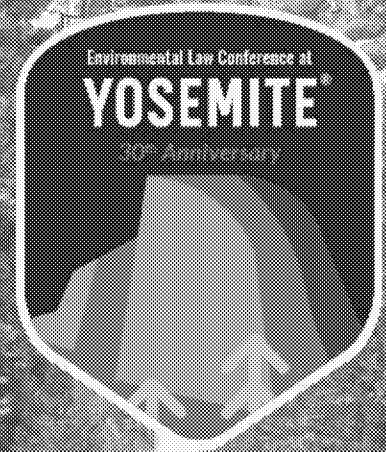
# Regulations: oil and gas

- EO 13990 instructed EPA to:
  - consider strengthening current standards for methane emissions from new, reconstructed, and modified sources
  - address methane and VOC emissions from existing sources
- Joint Resolution under Congressional Review Act disapproved EPA's 2020 Policy Rule
- For the past several months, EPA has been conducting an extensive outreach effort as it crafts this proposal



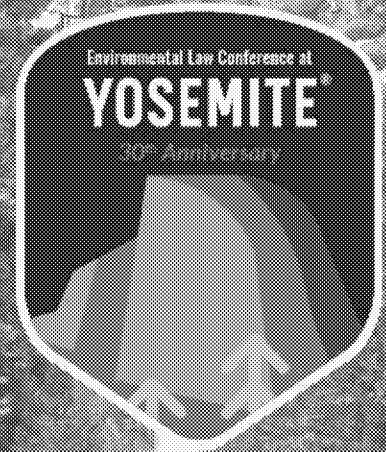
# Regulations: power plants

- EO 13990 directs EPA to review MATS
- EPA must issue CO2 emission guidelines for existing power plants under S. 111(d), per the D.C. Circuit's January decision vacating the ACE rule
- The Administrator has charged EPA staff with developing a well-coordinated strategy for implementing our power sector programs
- Strategy should also encompass other regulations and programs (e.g., interstate transport of air pollution, Regional Haze program, Coal Combustion Residuals rule; Effluent Limitation Guidelines)



# Regulations: HFC Phasedown

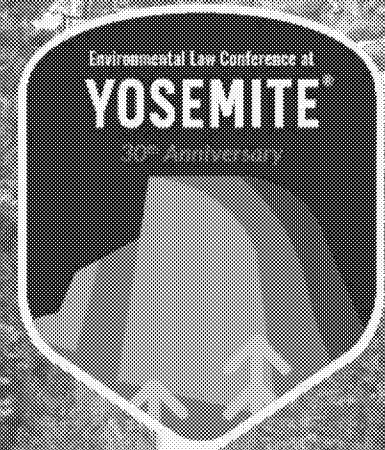
- EPA is working on the implementation of the AIM Act
- April 2021: Proposal to create a framework to phase down the production and consumption of hydrofluorocarbons
  - Allocation program
  - Baseline
  - Compliance and enforcement
- First issuance of allowances for 2022: October 1, 2021





# Voluntary programs: climate partnerships

- Climate partnerships play a critical role alongside EPA's regulations:
  - They seek to overcome market barriers, drive policy at the state and local level, and channel private action on climate, enabling cost-savings and job creation
  - Reductions comprise a significant portion of U.S. GHG emissions
- Examples:
  - ENERGY STAR: measures energy performance
  - GreenChill: reduces refrigerant emissions to protect the ozone layer
  - SmartWay: improves freight sector's fuel efficiency
  - Global Methane Initiative: international effort to reduce methane emissions



# Thank You!

